







MEDICAL & PHYSICAL

MEMOIRS,

BY

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IN TRANSYLVANIA UNIVERSITY.

1826

2086

LEXINGTON:

Printed at the office of the Kentucky Whig.

1826.



PREFACE.

The following Memoirs contain several views and expositions, scientific and professional, which, as far as the author is informed, are not to be found in any other work. For ought he knows to the contrary, therefore, they may be regarded as new. Certainly they originated with himself, and were not derived from any written source.

Most of these he embraces in his lectures, and delivers to a class, many of whom, from want of experience and maturity of intellect, are not competent judges of their truth. He deems it, therefore, his duty to publish them, and thus submit them to the scrutiny and judgment of those who are competent.

If his opinions and principles be sound, they will sustain an examination by the professional and the enlightened, and prove worthy to be inculcated on the minds of his pupils. But if they be defective, they will crumble under the touch of severe analysis, and ought to be no longer propagated among the youth of the country. In either case, the ordeal of public opinion must decide. Nor can a doubt be entertained, that, sooner or later, it will decide correctly.

In no other way, as the author feels persuaded, can he do strict justice either to the public, his pupils, or himself. If his opinions are *true*, they must be *useful*; and, therefore, the earlier they are made known, the more auspicious will be the issue to all whom they may concern. But if they are erroneous, they will produce mischief, and cannot be too soon examined, and rejected. In any event, then, to publish must be of good effect; because, in the march of knowledge, the *subversion* of error, if not tantamount to the *discovery* of truth, is the usual *harbinger* of it.

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MEMOIR I.

AN INTRODUCTORY ADDRESS,

INTENDED AS

A defence of the Medical Profession against the charge of IRRELIGION and INFIDELITY, with thoughts on the truth and importance of NATURAL RELIGION. Delivered, November 2nd, 1824.

GENTLEMEN,

Amidst the numerous manifestations of respect, and the repeated expressions of high commendation, which, by its dignity and usefulness, the profession of medicine commands from the world, it experiences, in relation to one subject of great importance, a want of charity and courtesy, not to term it wanton injustice, and sustains, on that ground, no inconsiderable degree of unmerited reproach. The subject alluded to is that of religion.

While in talents and attainments, practical benevolence and morality, and all the minor virtues and ornamental attributes that belong to the character of the educated gentleman, the accomplished physician is universal~~ly~~ acknowledged to have no superior, he is too generally charged, if not with *infidelity*, at least with a marked indifference towards religion, and a habitual neglect of his duty to his God. And the only plausible ground on which the charge is erected, is his *seeming disregard of public worship*.

If, in the language of the poet, this accusation “were true, it were a grievous fault, and grievously would the accused be destined to answer it.”

But if, on the contrary, it be radically unsounded, originating with those who prefer it, in a spirit of illiberality, and an ignorance of the duties belonging respectively to the different walks of civil and social life, justice requires that it be unequivocally revoked, by its offending authors. Nor should the matter be suffered to terminate here. To prevent its revival, it should be repelled and refuted, by the guiltless and the wronged.

Having the honour to occupy the station, and to be engaged in the functions, of a public teacher of medicine, I hold it my duty to aid, with such limited means and powers as I may possess, in defending the profession with equal fidelity and zeal, against unintentional misrepresentation, and premeditated calumny.

Nor is this a duty from the performance of which either my feelings as a man, or my character as an officer, permit me to shrink. Could I, for a moment, believe medicine, either as a branch of science, or a practical pursuit, to be inimical to sound and rational religion, much as I am enamoured of it, and essentially as the cultivation of it *has* contributed, and *still* contributes, to the highest and most durable enjoyments of my life, I would abandon it for ever. Indulge me, then, I pray you, on the present occasion, in claiming for a time, your patient attention, while I engage in a humble, but faithful effort, to wipe from it the defamatory charge of irreligion.

That physicians who are engaged in a practice, at once extensive, laborious and engrossing, are less fre-

quently seen in the *high places* of religion, than most other characters of similar standing, is possibly true. Yet facts are wanting to *convince* me that it *is so*. The examples are numerous which might be cited to prove, that, in the *strict* and *technical* meaning of the term, physicians have been among the most *pious* of men. Nor is it less true, that, as a general rule, those individuals of them most distinguished in the science of nature, have been most eminent for practical piety, and active benevolence. To say the least, in the regard it manifests for religion, in all its relations, the profession of medicine stands on an equality with the profession of law.

But, for argument's sake, I am ready to admit, that practitioners of the healing art do not so frequently exhibit themselves at church, in all the studied formalities of devotion, as other respectable members of the community. What then! Are all who thus appear in *holy* places to be ranked as *holy*, and all who remain elsewhere to be accounted *impious*? To this interrogatory fanaticism itself will not hazard an affirmative reply.

Are physicians, then, on account of *their* absence, guilty beyond others of neglecting the duties enjoined on them by religion? Are they alone to be calumniated and wantonly charged with infidelity, because they do not always worship *formally*, *to be seen of men*? Because, less solicitous about the *external glitter* of the chalice, they are more attentive to its *purity within*? Because they prefer the silent but substantial devotion of the *heart*, faithfully engaged in high and *indispensable* duties, to the loud and ostentatious professions of the lips, when the practice of such professions would

interfere most essentially with the performance of those duties? And because, as their practice demonstrates, they discard the narrow considerations of *self*, and give the welfare of others a preference to their own?

Is it, I repeat, on account of conduct like this, that those who are often the ornaments, at once, of human nature, and the profession they pursue, are accused of a want of practical piety? Of a cold disregard for the author of that religion, whose divine precept, enjoining mutual love, and the reciprocal exercise of the benevolent affections, they spend their lives in endeavouring to fulfil? With such individuals let me take my chance of usefulness and true respectability *here*, and of happiness or misery *hereafter*, rather than with those who, themselves strict conformists to the *usages* of religion, presumptuously censure and heartlessly condemn them.

Did physicians, from a sentiment of indifference, or a spirit of active hostility to religion, consume their time in idleness or dissipation, rather than repair to places of public worship, to join in offerings of gratitude and adoration to the father of the universe, their example would be pernicious and their conduct reprehensible. But, when the cause of their absence from the temple and the altar, is active philanthropy, manifested by a deep and absorbing devotion to the duties of their profession! When they are engaged alike in the services of the physician, and the charities of the man—ministering to the sick, relieving those that suffer pain, consoling the afflicted, pouring into the bosom of wretchedness the healing balm of sympathy and friendship, wiping the tear from the cheek of sorrow, and, where life cannot be

saved, soothing the agonies of the descent to the tomb—When thus occupied in removing or mitigating the “thousand ills that flesh is heir to,” they may, with hearts as pure, hopes as heavenly, and expectations as rational; that their petitions will be granted, implore, from a God of compassion and benevolence, a blessing on their labours, as if, with bended knees, and uplifted hands, they acted their part in an assembly of worshippers.

The position being so incontestible as to constitute a truism, I need scarcely state to you, that it is not to be expected, because, in the nature of things, it is not intended, that all men should do homage to their God in the same way. Every duty, of whatever description, provided it be performed from a laudable motive, is an act of worship acceptable to the Most High. For HE is no more a respecter of *forms* than he is of *persons*. HE requires the incense of the heart, offered up under the direction of the intellect, enkindled by zeal, and fanned with vestal fidelity and vigilance, and with that he is satisfied. To the truth of these sentiments his own declaration conclusively testifies.

Whether, therefore, the act of duty, which is but another name for an act of worship, be performed by the physician in the chamber of the sick, by the patriotic senator in the hall of legislation, or the conscientious advocate within the walls of the forum; by the mariner rocked on the tempest-shaken mast, the warrior fighting the battles of his country, or the professor of religion at the foot of the altar; if the heart be devoted and the motive correct, the offering will be alike meritorious and alike holy, in the estimation of that JUDGE, who is at once

omniscient, benevolent, and just. Let no man dare to condemn the act, on account of its want of a *prescribed form*. Provided its *spirit* and *substance* be right, it is all right, the mere mode of performing it being but the *external shadow* of the substance which is within. To contend for the reverse of this, and to make the Deity a stickler for a system of rituals, is to insult his majesty, and presumptuously degrade him to the level of man.

He that most ably and faithfully performs his duty to his fellow men, acquires himself most acceptably in his relation to his God. In reason, this may be pronounced an incontrovertible truth. If it be not also true in theology, then is that a branch of knowledge which reason condemns.

That the truth and force of this position may the more fully appear, let us bring it to the test of the following conjecture.

A city is invested by a powerful enemy, resolved on conquest, rapine, and massacre. The temples are opened, and in obedience to his own sense of duty, and the usages of the place, the commander in chief of the besieged party is engaged with others in a public act of religious worship.

With hurried step and anxious eagerness, an officer approaches him, and announces that the assault has already commenced, and that the enemy, in numbers, are thundering at the gate.

In this emergency, what is the obvious duty of him to whose valour, vigilance, and skill in arms, the defence of the city and its inhabitants is entrusted? By which procedure will he manifest most acceptably his duty and perfect devotion to his God—retaining his position in

the house of worship, until the service is finished, or rushing instantaneously to his companions in arms, to animate them by his presence, direct them by his genius, mingle with them in battle, and lead them to victory by his heroic example? Let the question be propounded even to the ecclesiastic who is ministering, at the moment, in holy things, and, with that promptitude and eagerness which the occasion inspires, it will receive emphatically the proper reply. That divine will not only, from his sacred desk, exhort his commander to hurry to his post, but, if his heart be manly, his temperament enthusiastic, and his soul devoted to his country's welfare, he will himself accompany him.

In a crisis like this, the duties of the assembled congregation are various, according to the services they are fitted to render. Let the brave and the vigorous repair to the walls, to repel the foe, while the rites of devotion, if they must be performed, belong only to those, who, from feeble arms and feebler hearts, are capable of nothing more suitable to the occasion.

Order is Heaven's first law. A place for every thing, and every thing in its place.

Nor is this less true in relation to the management of the affairs of earth. Sublunary concerns, of every description, are best conducted, when this law, in the regulation of them, is most strictly observed.

Let the divine, then, the jurist, the civilian, the warrior, the philanthropist, and the physician, labour, each in his own vocation, precisely as the nature of that vocation demands, and the harmony and welfare of society will be the issue. Let them usurp, in any measure, the functions of each other, and confusion and disaster

will inevitably ensue. Earth will become a scene of moral chaos and wild misrule.

To this scheme of specific and exclusive duty, it will no doubt be objected, that there is a time for all things. That the sabbath is the time for public worship, and that physicians ought devoutly to unite in it with others.

To this the reply is obvious and satisfactory. Of the physician, engaged in extensive practice, it may be emphatically affirmed, in the language of the poet, that

“Sunday shines no sabbath day to him.”

In the sufferings and ravages of disease, no Sabbath is instituted either by divine or human authority. Nor is he whose business is a perpetual warfare with them, permitted to calculate on a day of rest.

A physician in the midst of disease, is like an officer stationed on the lines of an enemy. His duty is at his post, where he must be constantly on the alert, sufficiently fortunate, if, by all his vigilance, he can escape the disasters of circumvention and surprise.

While others are ministering in heavenly things, or partaking of the ministry, he must be engaged in rescuing the sick, or protecting the healthy, from the open assaults and secret machinations of a dangerous foe.

When the practitioner of medicine is thus, in the performance of the functions of his profession, rendering himself most useful to his fellow men, he is best discharging his duty to his God. And were he suddenly summoned from his abode on earth to the JUDGMENT SEAT ON HIGH, he may approach it with a heart as pure, a conscience as tranquil, and hopes as lively, from the discharge of his professional services in the chamber of sickness, as if he had been kneeling in

the house of prayer. If any tenets of any religion be at war with this, they are equally at war with reason and benevolence, and ought to be rejected as heretical and dangerous. Their source is in the blindness of the human mind, and the pride and selfishness of the human heart, not in the wisdom and moral perfections of God.

Let me not, I entreat you, from any sentiment expressed or implied by me, on this occasion, be pronounced or considered an enemy to *forms* of religious worship. From none of the premises here defended can such an inference be legitimately drawn. Nor can any individual be further than myself from harbouring a hostility so unreasonable and pernicious. Such is the character of the human mind, that, for the successful cultivation of pious feelings, in mankind at large, *forms* of worship are necessary *in themselves*. They are sanctioned, moreover, by divine authority, having been practised by the FOUNDER of the christian religion. When nothing, therefore, of superior moment, intervenes to prevent it, a regular conformity to them becomes a duty. But it is not to be regarded as a *paramount* duty. It is not essential to the saving of the soul. A fitness for Heaven can be attained without it. It is not, therefore, of a nature so high and holy, that the neglect of it, under the pressure of weightier duties, is to be received as evidence conclusive of infidelity or irreligion. The heart may be as piously and ardently engaged in religious exercises in the retirement of the closet, or when contemplating, in the silence of solitude under the wide arch of heaven, the beauty and grandeur of surrounding nature, as it can within the walls of the solemn

temple, touched by the influence of sacred music, and placed in the midst of adoring thousands.

To affix on physicians, then, the slanderous imputation of infidelity, merely on account of their constrained neglect of public worship; argues, in those who perpetrate the outrage, a heartless want of christian charity, not to say of *a love of truth*, and is, in its relation to those who *suffer* it, an act of wanton and flagrant injustice. When committed, as it usually is, by professors of religion, it is an outrage and a crime, not only against the individual injured, and society in general, but in its immediate relation to the Deity himself, whose laws it violates, and prostitutes to the purposes of slander his holiest institution.

But we are told that it is not the mere neglect of the ceremonials of public worship that attaches to physicians the suspicion and charge of infidelity and irreligion. It is asserted that, in its very nature, the *science of medicine* is unfavorable to a belief in the truths of theology.

That that science, in common with every other which enlightens, expands and liberalizes the mind, (*a*) is hostile to theological fanaticism and bigotry, to all unfounded sectarian dogmas, all intolerant puritanical feelings, and all vindictive ecclesiastical denunciations—to every thing that tends to mislead the judgment, narrow the soul, and ruffianize the bosom of man, by tramelling his intellect, and deracinating charity and benevolence from his heart—that the science of medicine is hostile to theology of this description, which, bearing about it no characteristics of celestial origin, gives fearful manifestations of an opposite parentage, is certainly true. And

so unquestionably it ought to be. All nature is at war with theology like this; and Heaven itself indignantly disclaims it, as a foul misrepresentation of its canons of truth.

Action and reaction are, in all things, equal and opposite to each other. That scheme of theology, then, which makes war on science, may be assured that science will return the assault. But *true* theology and science are not at war. They not only harmonize with each other, *they are one*.

Theology is the science of Deity, including the boundless range of multifarious and reciprocal relations that exist between HIM and the universe which he governs. When considered, then, on a *catholic* scale, the science of medicine may be truly denominated a *branch* of theology; for, taken, in its entire scope, it communicates very amply a knowledge of the Deity, his attributes and laws, through the medium of his works. Far from being hostile, or in any degree unfavourable to it, when cultivated, in its full extent, it opens to its votaries an abundant source of *religious instruction*—not embittered by that militant spirit which breathes forth hatred instead of love; but that *pure and heavenly kind of instruction*, which addressing itself to all the faculties of the mind, ameliorates the whole of them—illuminates and strengthens the intellectual powers, and disclosing the wide spreading harmonies of nature, improves the moral character of man, by fostering in his soul the spirit of benevolence, the temper of forbearance, and the love of peace.

To such an extent is this true, in relation to the science of medicine, that, in imitation of the poet, when he exclaims,

"An undevout astronomer is mad."

I might here assert, on firmer ground, and with a stronger emphasis, that the physician who is destitute of religion is deranged.

There exist, by consent almost universal, two sources of religious knowledge; and, when considered in their relation to the enlightened and the philosophical, I presume not to decide which of them is richest in the treasures it contains, or the measure of invaluable instruction it imparts. They are the *word of God*, as communicated in the *Scriptures*, and the *works of God*, as exhibited in *creation*. On the former is founded *revealed religion*; from the latter is derived the *religion of nature*. Such, at least, are the terms by which these two schemes of theological science are denominated. But perhaps improperly; because, in their fundamental principles, they are *one*. In the genuine interpretation of the term, they are *both revealed*; for the Deity speaks through the medium of his other and more general works, as audibly and intelligibly, as he does by the lips or the pens of his prophets.

As far as nature extends, natural and revealed religion are and must be the same. Miracles alone excepted, whatever is true in religion is conformable to *nature in her ordinary course*; and whatever is *contrary* to nature, is a departure from truth, whether it be denominated religion or not.

If any one deny the soundness of this doctrine, he makes the Deity contradict himself. Nor can my reason for making this assertion be concealed, for a moment, from the humblest inquirer. God is as much the author of *nature* as he is of *revelation*. Surely, then, he can-

not, without *self-contradiction*, make the *latter* speak one language, and the *former* another. But he is not *self-contradictory*. They, therefore, speak the same language; and, when, properly understood, inculcate necessarily the same doctrines and the same practices. (*b*)

All religious truth has the same origin. It is a pure and precious stream, springing from the fountain of Deity himself. But by the bounteous and beneficent dispensations of its **AUTHOR**, it flows to man through several channels, because it is essential that he should have it with *certainty* and *in abundance*.

Let us be careful, then, not to undervalue the truths imparted, merely on account of the medium through which they may reach us. Let us not confound the *things* with their *sources* or *channels*. They are equally valuable whether they come to us in *words*, from the lips of inspired men, who are, at best, but the *oracles* of God, on the occasion; or from the common works of nature, which are *equally his oracles*. In the former case, we receive the purposes of the Deity already interpreted and clothed in language. In the latter, we receive the same purposes, to be interpreted and clothed in language by ourselves. In either case the process is *revelation*.

To the votaries of medicine, the Scriptures containing the word of God, are as open as they are to the cultivators of other professions. To all physicians, therefore, revealed religion *may* be familiar, and to many of them, it *is so*. But, in relation to the *works* of God, they constitute, in a peculiar manner, the physician's domain. Them he must study—The knowledge derived from them he must appropriate, and render his own, else is

be unworthy alike of his vocation and his name. With natural religion, then, he can scarcely fail to be as familiar, as he is with the structure of the human body, or the medicinal properties of the articles he uses in the practice of his profession.

Waiving entirely the influence produced on him by revealed religion, which, living and mingling as he does in a community of christians, must be necessarily considerable, his intimate acquaintance with the religion of nature, although fortunately it can render him neither fanatical nor intolerant, must infuse into him sentiments of veneration and piety. For the student and lover of the beauties, beneficences, and sublimities of nature, to be without such sentiments, would seem to be impossible. Nothing but a heart of marble in a bosom of adamant, could present such an anomaly of moral insensibility.

To ascertain more satisfactorily the effects of natural religion, on the minds of those who have attentively studied it, it is only requisite to contemplate, for a moment, the extent and character of the information it imparts.

For this purpose it is sufficient to say, that it teaches the knowledge of the *existence* of God, of his perfections generally, and of his original organization, and his moral and physical government, of the universe. A few points connected with the immediate scheme of christian salvation excepted, it teaches whatever essential is contained in revealed religion. (c) In its code of moral and social instruction, it may be pronounced perfect. (d) It shows, in a particular manner, and most impressively, the dependence of all things on the Great Supreme, and his beneficent superintendence of all; and

thus implants and cherishes in the soul, the celestial seeds of gratitude and devotion.

This it does by opening to us a view of the *chain* of creation, the first link of which, being attached to the footstool of Deity, the others descend in regular gradation, the inferior supported and retained in its place by its immediate superior, connecting thus, by an indissoluble tie, the lowest grade of being with its CREATOR, who himself sustains and wields, at pleasure, the stupendous fabric. It discloses, moreover, throughout this interminable range of existence, that exquisite adaptation of the parts to each other, and their perfect subordination and fitness to the whole, which nothing but infinite wisdom could effect.

In relation to most of the attributes of the Deity, there would seem to exist a vast disproportion between the manifestations of them made by *revealed* and *natural* religion. To the truly intelligent and philosophical mind, capable of analysing the fabric of creation, and comprehending and enjoying the spectacle it presents, that manifestation effected by the latter, is unspeakably the most magnificent, impressive, and sublime. The reason of this is obvious. The one, is made in *words invented by man*, the other by *works in which Heaven* put forth both its *wisdom* and its *power*. But, waiving the consideration of the infinite distance between the capabilities of the actors in the present instance, who does not know, that, in all cases, works can exhibit what no powers of language can describe.

Works are demonstration by appropriate machinery. *Words* are description, and nothing more. In point of perspicuity, force, and impressiveness, the difference be-

tween these two modes of communication is immense. It is the same that exists between two lectures in philosophy, one of them simply recited in words, the other illustrated by suitable apparatus.

When the Deity is represented as riding on the whirlwind, as making clouds and thick darkness his pavilion and his covering, as holding the sea in the hollow of his hand, and commanding the raging of the tempest to be still; or even as organizing and governing the few heavenly bodies, which, glittering only as diminutive specks, are visible to the naked eye—When thus depicted, by masters of description, his power and majesty are forcibly felt.

But, sublime and imposing as this description may be, in the abstract, it is nothing but a selection and collocation of words, invented by man as suitable representatives of his limited conceptions, most of them bearing relation to our own little globe. Faint and feeble, then, must it necessarily appear, when contrasted with the pageantry and unspeakable grandeur of a systematized universe, in the construction of which OMNIPOTENCE has toiled!—a universe consisting of millions of orbs, some of them millions of times larger than this we inhabit, all of them *individually*, or *arranged in systems*, with inconceivable velocity and power, moving around each other, and the whole collectively around a common centre, not only without collision or inconvenience, but with a harmony and order, produced and sustained by the exquisite adaptation and balance of those powers and movements, that would seem to be destined to create confusion! Compared, I say, to the omnipotent and omnipresent Deity of a universe like this, what is the

God of a whirlwind, a tempest, a limited ocean, an entire globe, or even a circumscribed system of globes, constituting collectively but a single group, lost in the boundless gallery of creation! But, I must not indulge in the further pursuit of this contrast, lest, *in direct opposition to my intention and feelings*, the language, which the nature of the subject would compel me to use, might be *considered* by the *feeble*, and *represented* by the *designing*, as disrespectful and injurious to revealed religion.

Physically speaking, then, the Deity, as exhibited in the works of creation, is transcendent over all that language can express. And to this effect are the words of revelation itself, where he is declared to be, in his character and perfections, "*unspeakable.*" (e)

Nor is his *moral* government, as set forth in the scheme of *natural* religion, in a less degree pre-eminent over that which is ascribed to him in *revealed* religion.

In the latter system, without any positive reference to *other peopled worlds*, he is represented as limiting his moral government to the *inhabitants of this*. For *them* alone, has his bounty provided. For *them* has he formed the sun, the moon, and the stars, and hung them in the heavens as lamps to direct them.

According to this representation of his standing in creation, man would seem almost privileged to exult with the poet, in the following high-wrought effusion of pride:

"For me kind nature wakes her genial power,
"Suckles each herb, and calls forth every flower;
"Annual for me the grape, the rose renew
"The juice nectarious and the balmy dew;
"For me the mine a thousand treasures brings,
"For me health gushes from a thousand springs;
"Seas roll to wast me, suns to light me rise;
"My footstool the earth, my canopy the skies."

But, far different, in compass and magnificence, is the range of moral government, which the religion of nature bestows, on the *creator*, *sustainer*, and *director* of a *universe*. In this stupendous scheme of things, millions of worlds, peopled by millions on millions of inhabitants, swelling to a number surpassed by nothing short of infinity, are necessarily embraced, and God is the father and governor of them all. These, like ourselves, are heirs of immortality, and candidates, destined we hope to be successful ones, for endless, progressive, and indescribable felicity. (f)

If my judgment and feelings do not eminently deceive me, this view of things, exhibited in creation, is much better calculated to give *elevation* to the *Deity*, and *humility* to *man*, than any that the *powers of language* can present. But I need not add, that these are two of the *cardinal* objects of *religious* instruction.

From the sentiments here disclosed, let no one impute to me the demoralizing and unchristian design, of elevating *natural*, to the intentional degradation of *revealed* religion. The charge would be equally illiberal and false.

But, while I venerate the *Scriptures* as the *oracles* of Heaven, I cannot do less in relation to the organized universe, which I am compelled to regard, if not as a kindred emanation from *Deity* himself, at least as a mirror reflecting the image of his divine perfections. Nor can I refrain from speaking of those two sources of heavenly knowledge, as characterized by different kinds of excellency. While the one is more explicit and abundant in practical instruction, the other is more sublime in the truths it reveals. The latter exalts and enno-

bles the soul, while the former conducts it more unerringly in the path of duty.

Such is a brief and imperfect sketch of the knowledge which the religion of nature imparts. Poured as this knowledge is, in copious and uninterrupted streams, into the mind of the *cultivated* and *observant* physician, it is impossible for irreligion to take root in his heart. Of the mere *pretender* and *sciolist* in medicine, I am not the defender. To his profession he is a dishonour. Of his character, in a religious point of view, let others judge. I dismiss him, at once, from further notice, in the terms of a well known passage in poetry, which is not more remarkable for the harmony of its numbers, than the correctness of its sentiment.

“A little learning is a dangerous thing,
“Drink deep, or taste not the Pierian spring—
“Here shallow draughts intoxicate the brain,
“But drinking deeply sobers it again.”

I know it will be said, perhaps by *several*, certainly by *one* individual who hears me, not only that the representation I have given of the beauties and excellencies of natural religion is greatly exaggerated—not only that I have preternaturally multiplied and magnified the advantages supposed to be deriveable from it, but, that, in reality, such advantages have no existence—and, to finish the climax of this anomalous creed, that natural religion is itself a *fiction*, all religion being necessarily derived from *written revelation* alone.

The reason rendered for this opinion is, that by no examination of material creation, can man arrive at a knowledge of the existence of God, who is exclusively the object of religious worship. That, had he not revealed himself by *oral communication*, the universe

might have continued to exist, its arrangement and economy have been disclosed, and man have cultivated, as he has done, the science of nature, and still have remained ignorant of the very *being* of the *God* of nature.

In relation to this subject, we are further told, that, had not the fact been specifically revealed to us, we could never have formed a conception of the production or organization of the solar system, or any part of it, nor of the other systems and orbs that revolve through the heavens. But, that the entire fabric of material nature would have appeared to us to be either *self-existent* and eternal, or *self-formed, self-sustained, and self-governed*, itself at once the cause and the effect, and at once the agent and the subject, the operator and the thing operated on, in the production of all the phenomena of creation. And again, that on the subject of spiritual existence, we should have been utterly ignorant. Of course, the existence of the human mind, as a *spirit*, and its destiny as an *immortal* one, would have been a secret to itself.

Whatever may be the sentiments of others with regard to it, to *me*, this hypothesis, attempted to be maintained and propagated, at this enlightened period, and in this place of science, is strikingly singular. But perhaps its singularity arises from its novelty. For it is not long since I was first aware that it had a single advocate. And I must be permitted to add, that an attempt to revive the Egyptian notion of metempsychosis, or any of the transcendental visions of Plato, would not have more surprised me.

If this hypothesis be true, it will prevail; for truth is omnipotent and cannot be resisted. And if it prevail,

it will produce a very signal change, and constitute a memorable epoch, in the science of theology. It will remove from the eyes of the theosophist the thick scales that have dimmed his vision, and introduce him to a view of things entirely new. True or false, it is worthy of examination. If nothing else contributes to elevate it, the subject to which it relates bestows on it importance. Suffer me again, then, to crave your patience, while I proceed in my disquisition.

Were I, in the discussion of this subject, to rely for argument on the sacred Scriptures—and where is the authority that is higher or holier—from that source of divine and immaculate truth, evidence might be abundantly adduced in my behalf.

In maintaining the omnipotency of God, Job, for testimony confirmatory of its existence, thus eloquently refers to the works of nature.

“But ask now the *beasts*, and *they* shall *teach thee*, and the *fowls of the air*, and *they* shall *teach thee*;

“Or speak to the earth, and *it* shall *teach thee*; and the fishes of the sea, and *they* shall *declare unto thee*.

“Who knoweth not, *in all these*, that the hand of the Lord hath wrought this?” Job. chap. xii. ver. 7, 8, 9.

“The Heavens, says the psalmist, *declare the glory of God*; and the *firmament sheweth his handy work*.

“Day unto day uttereth speech, and night unto night *sheweth knowledge*.

“*There is no speech nor language where their voice is not heard*.

“Their line is gone out through all the earth, and their words to the end of the world.” Psalms, xix. ver: 1, 2, 3, 4.

Again. “And the *Heavens* shall declare his (God’s) righteousness; for God is Judge himself.” Psalms L. ver: 6.

Speaking in reference to unrighteous men, the apostle Paul thus expresses himself:

“Because that which may be known of God, is manifest in *them*; for God hath shewed it unto *them*.

“For the *invisible* things of him, from the creation of the world are *clearly seen*, being understood by the *things that are made*, even *his eternal power and Godhead*; so that they are without excuse.” Epistle to the Romans, chap. I. ver: 19, 20.

That these texts of Scripture testify most explicitly to the manifestation of God, through the medium of his works, cannot, in a spirit of candour, be denied.

But knowing that a different meaning is attached to them by cavillers, and being unwilling to engage in a war of *mere construction*, I shall waive all claim to the authority which they offer me, and endeavour to derive my evidence and argument, from a source which speaks a language that no sectarian interpretation can distort.

To me it appears, that the doctrine of the absolute necessity of oral revelation to our knowledge of the being, attributes, and government of God, is fraught with considerations of no ordinary moment, which its advocates, (if *advocates* it has) in the ardour of their zeal to establish it, have entirely overlooked.

If it be true, it argues, or I deceive myself, a striking defect in the high operations of creative wisdom.

Admitting the infinity of the wisdom, goodness, and power of God—and no one, I am sure, will dare to deny it—it follows of necessity that creation itself must

be a system of optimism—a scheme of things as perfect as Deity can make it. I speak under impressions of reverence in declaring, that to this effect the Deity is bound by his own perfections, and cannot violate the laws which they impose. That by the Fate, constituted by his infinite attributes, was the Creator constrained to give birth to a universe, *in its totality*, as unexceptionable and perfect as himself. Nothing short of a creation like this would be worthy of him, or could acquit him at the bar of his own tribunal. If he requires of his creatures that their works shall be as *faultless* as their *capabilities* can render them, he cannot himself have failed to set them the example.

To say less of him, or to feel towards him less reverence than this sentiment conveys, would be, in a spirit of rebellion, if not of blasphemy, to deny his perfections and offend his majesty. To pronounce the Deity, *all-perfect* as he is, the author of *imperfection*, is self-contradictory. If HE is without defect, so must be *his creation*. He himself has told us that the tree is known by its fruit. If the parent be spotless, spotless must be the offspring, when viewed in relation to *universality and ultimate design*.

But to make it, in its totality, perfect, there must exist between the component parts of the universe, and between the parts and the whole, a perfect adaptation. They must be, in all respects, as exquisitely fitted to each other, as infinite wisdom and power, actuated by infinite goodness, can render them. By this test let us examine the hypothesis under consideration.

If this hypothesis be true, it involves a dilemma, be-

tween the difficulties of which its advocates are at liberty to choose for themselves.

Either the Deity has constructed a universe so defective in its organization, and imperfect in its movements, that it makes no manifestation of divine wisdom, in which the hand of the architect may be discovered; or he has created man, as an *intelligent being*, too dull of intellect to *make* the discovery, to enjoy it, and to profit by it. In either case there exists a defect in the *wisdom, power, or goodness*, of the **CREATOR**, or in *all* of them. That it would best comport with these attributes, as well as with divine *justice*, that man, as an *accountable being*, should be able, wherever placed, to arrive, in some way, at the knowledge of God, and of his own responsibilities, cannot be denied. On no other ground can he be charged with guilt, or rendered accountable for any of his actions. For the Deity to hold a creature, formed and disposed of by himself, responsible, under the penalty of fearful punishment, for not knowing and worshipping him, and, at the same time, to conceal from that creature his very existence, would be worse than injustice. It would be the consummation of cruelty and tyranny united. Were an earthly tyrant to act thus towards any of his subjects, he would justly encounter the execration of the world. Surely, then, to such a charge the *Fountain* of justice, benevolence, and goodness, cannot be liable. To prefer it against him would be unqualified blasphemy.

That portion of mankind to which the *word* of God, as contained in the Holy Scriptures, has found its way, is exceedingly limited. Throughout the lapse of several thousand years, this *has* been the case; nor is it

likely to be otherwise for thousands yet to come. What, in the mean time, is to be the destiny of those millions of mortals, who, never having been favoured with a sight of his *written word*, are forbidden to obtain a knowledge of God through the medium of his *works*?

To this I am aware that an answer is attempted.

We are told that those unfortunate and benighted beings, who are thus deprived of all better resources, but whose salvation is staked, notwithstanding, on the issue, must be content with the "dim green lights" of tradition. Faint and miserable lights, indeed, contrasted with the object to which we are informed they are intended to lead!

Under the most favourable circumstances, tradition is a medium entirely insufficient to convey and perpetuate, with an accuracy to be depended on, a knowledge even of ordinary affairs. If not in the *nature* of things, at least in the *issue* of them, tradition and fiction are so nearly allied, that an age of tradition never fails to be an age of *fable*. To the truth of this, observation and history abundantly testify. Yet, in the present case, under circumstances as inauspicious as can possibly be imagined, knowledge, essential to the everlasting welfare of an immense proportion of the human race, is entrusted exclusively to this narrow, uncertain, and perverting channel—A channel which *never has* remained free from pollution, during the period of *a single generation*; and, while man retains his present character, *never will*.

Thus the case is made to stand. At the close of the deluge, Noah and his family possessed a knowledge of the true God. But, in a short time among their descendants, who still continued to speak the same lan-

guage, this knowledge was either lost, or in a high degree adulterated.

In the plain of Shinar, the common language which they had hitherto spoken was taken from them, various others substituted in its place, and they themselves, to meet no more, were widely scattered through different, remote, and dissimilar regions. Under this revolutionizing and memorable dispensation, some of them sought the vicinity of the sun, to pant in the shade beneath his tropical fires, others penetrated into the climates of the north, to buffet the polar blasts, and contend with the rigours of a protracted winter, while a third portion of them selected, as their places of abode, countries favoured with milder skies, and situated between the two extremes.

To those who understand the philosophy of language, its nature and influence as a medium of recollection, and the effect which a sudden and entire change of it must necessarily produce on the human mind, in relation to knowledge previously acquired, all comment on this event would be superfluous.

A combination of causes better calculated to confound knowledge of every description, if not entirely to erase it, no ingenuity of man can devise. Nothing can surpass it short of an obliteration of memory itself. Our recollections through the familiar and delightful medium of our mother tongue, are the only clear and definite recollections we have.

By those who were thus dealt with in Shinar, what events of their lives would be likely to impress them most deeply and permanently, to be most vividly remembered and most repeatedly talked of by them, and

handed down by tradition to their immediate descendants, and by them to *their* descendants, from generation to generation, until remembrance should be lost in the remoteness of futurity?—I answer, it would be the erection of the Tower of Babel, with the object for which it was intended, the miraculous confounding of their tongues, and their dispersion and journeying thence to their various places of destination. These occurrences, I say, would be as likely—in my estimation much more so—to be held in remembrance by them, than the knowledge possessed by them in relation to the being or attributes of a God. But, in the traditions of unlettered nations, no remains of the description of such occurrences are to be found. (g)

Much is said of the perpetuation, by tradition, of the knowledge of the deluge of Noah; and an inference is hence deduced, that if that event could be thus handed down, so could a knowledge of God and of his government.

But to those who rely on testimony like this, for the establishment of their notions, it is important to recollect, that the earth exhibits, in various places, incontestible evidence of *sundry* deluges, (h) any one of which may live in tradition as readily and permanently, and be as likely to be spoken of, as that of Noah. From no fact of this kind, then, perpetuated in story, can any specific conclusion be drawn.

As far as the knowledge of a God is concerned, I have no hesitation in asserting, that to communicate it, from so distant a period as the time of Noah, only through the distorting tradition of ignorant and unlettered nations, is worse than not to communicate it at

all. For, on a subject like this, ignorance is certainly preferable to error. (i) And to preserve knowledge, in this way, unpolluted by error of the grossest character, may be pronounced impossible.

But all nations heretofore discovered, however wretched, uncultivated, and ignorant, have some notion of the *being*, as well as of the *superintending providence* of a God. They believe in the existence of one or more invisible and powerful agents, capable alike of injuring and benefitting them, and to which, therefore, their hopes and their fears are directed—which they invoke, and endeavour to propitiate, when adversity assails them, and to which, in prosperity, they render up their thanks. And where no revelation is concerned, their conceptions of the disposition and character of these agents bear a striking affinity to the interpretations they put on the phenomena and operations of nature around them. Indeed it is most obvious, that the elements of those conceptions are suggested by these operations.

In a boisterous and stormy region, the God of the ignorant is a God of tempests, rides on the whirlwind and directs its career, and awakens the hurricane, or bids it be still.

In a volcanic region, his attributes are, in some way, connected with fire; and, in a country of calmness, sunshine, and fertility, he is always invested with a corresponding character. He is the God of the seasons, producing, protecting, fostering, and maturing, the bounties of the earth. Or he is a malevolent spirit, capable of extinguishing the hopes of the year.

These facts, resting on abundant and conclusive testimony, demonstrate satisfactorily, that, in unlettered

nations, the views respecting a God, are derived from the contemplation of the works of nature.

Were tradition the only source of the knowledge of a God, it would give to him, necessarily, his attributes and his character. In that case, the God of the north would resemble, in his disposition and qualities, the God of the south; the God of the mountains would differ but slightly from the God of the plains and the valleys; and the God of the sea coast and of the interior would be the same. In fact, the God of every region and people would be alike, the attributes and general character being drawn from those of the God of Noah, their common prototype.

But so far is this from being the case, that the God of *every unlettered nation* is nothing else than a Being possessing, in the highest degree, those attributes and qualities which the inhabitants are enabled to discover in the works of creation. He is the *Beau ideal*, formed by a concentrated abstract of those attributes. Nor is it possible to communicate to them, by language, the knowledge of a God of any other description. Make the attempt, and you will find it to be fruitless. You will address them in sounds which are to them *meaningless*, because they can form no conception of the thing you would signify by them. You speak to them literally in an unknown tongue.

But describe to them your God by demonstrating his attributes as they are manifested in nature around them, and you render him intelligible to them. They know something of a storm, a whirlwind, an earthquake, a thunder-cloud, of fire, of water, of the sun, and of the moon. Represent him as the God of either of these,

and they will understand you. You furnish them with a solid tangible basis on which their minds can rest and act. But to construct such a basis out of *words* is not possible.

Constituted as we are, words alone can teach us nothing beyond what we may derive from inarticulate sounds, or from the terms of a foreign tongue which we have never learnt. To render language, *in the abstract*, a medium of instruction, the Deity would have to change miraculously the human intellect, if not the entire relation of things.

Without such a change, with suitable reverence do I make the assertion, he could not communicate to man a knowledge of **HIMSELF** *in mere words*. If not interpreted by *known objects*, *revelation* would be *unintelligible*. Hence, to such objects the language of revelation always refers. And hence revelation is uniformly made to man in the language he understands. Were it made to him in any other, it would be made in vain. It would, indeed, be no *revelation*, because it would *disclose* nothing. If made in the *Arabic* tongue, to an individual who understands only the *English*, it will not enlighten him. Yet, as well might it be made to him in a foreign and unknown language, as in *newly fabricated* words purporting to belong to his *mother-tongue*, but having no *root* in that tongue, nor any reference to objects already designated in it. Such words would constitute essentially a language unknown. To regard, them, therefore, as the medium of revelation, manifests an entire ignorance of both the origin, object, and powers of language.

To render theology, then, a rational science, com-

manding at once the approbation of the intellect and the homage of the heart, the lights of nature and the truths of revelation must be made to unite and fortify each other.

Inquire of our most intelligent missionaries who have been engaged in the work of propagating the gospel among the aborigines of our country. They will confidently tell you, that when they address the savage mind in the mere language of *written* revelation, they are not understood. To render themselves intelligible, and to produce an effect, they are compelled to have recourse to the *Book of nature*, and teach a knowledge of God through the medium of his works, as *interpreters* of the Holy Scriptures. So empty and unavailing—or, if I may be permitted to quote again my favourite poet, “so stale, flat, and unprofitable” is mere *nominalism*.

An attempt is made to show, on metaphysical principles, that, from its nature and capacities, the human mind cannot, without the aid of divine revelation, arrive at a knowledge of either the creation (*j*) of the universe, or of the being of a God. It possesses, we are told, no knowledge of any kind, except what it receives through the external senses. But it has never witnessed the work of creation going forward, nor has it any sense to take immediate cognizance of spiritual substance. Of such substance, therefore, it can have no knowledge, except what it receives through the medium of language. But God is spiritual. Of him, therefore, it can know nothing, except by the language of revelation proceeding from himself.

This is an effort to teach science by means of a syllogism. Let us analyse it and see whether its elements be sound.

The position we are about to examine is *general*. If, then, it be true, it is *radically* and *universally* so, and no fact can be adduced in direct contradiction of it. If, on the contrary, not only one, but many such facts can be cited, then it is unsound in its principles, and its advocates must abandon it.

In substance, this position is, that the human mind cannot be led to a belief in the existence of any being or event, except *immediately* through the channel of some one of the external senses. It must either see, or hear, or taste, or smell, or feel that being or event, or else remain for ever ignorant of it.

This proposition must be received as a problem rather than as a theorem. And if I am not mistaken, it will be found, on examination, to be built on a view of intellectual philosophy peculiarly defective. It takes from man the exercise and the fruit of his *reflective* powers, and reduces him to the humble rank of a *mere being of sense*. It denies him at once the power and the privilege of adopting any belief, as a *matter of reason*. In fact, it robs him of his reason altogether, making him a mere *mnad* in intellect—a creature of *primitive perception* and nothing more.

That the elements, or raw materials of all our knowledge enter the mind through the channels of the external senses cannot be denied. But humble indeed would be our intellectual rank, if we had not the power of assorting and combining those materials, and weaving them into the web of science or history, eloquence or song. Were this power denied us, where would be our philosophers, our statesmen, our orators, our mathematicians, our painters, our poets, our sculptors, and our ar-

chitects? Where, in fact, would be every monument of genius and intellect, which constitutes, at present, our glory and our pride? I answer, that, in the case supposed, those monuments would have no more existence among *us*, than they have among the herds of our pastures, or the flocks of our folds. To a condition thus barren and degraded would man be reduced, were the position I am examining founded in truth.

But, thanks to him who formed us as we are, it is not thus founded. Man is not a being of *sense* alone, but of *reason* also, as a higher power, to the operations of which our senses are tributary.

In the process of reasoning, by which I mean the disciplined exercise of the reflecting faculties, we discover many things, and are led to a belief in the existence of many things, of which our senses are incapable of giving us primitive information. Such, indeed, are the very object and end of our power to reason.

Could sense alone communicate to us every thing requisite to be known, reason would be useless. The function of this power is to take up the process of inquiry where sense leaves it, and cautiously proceed from the *known* to the *unknown*—from simple perception, to the most splendid *results* of the united exertions of the *reflecting faculties*.

In pursuing this course, the mind is oftentimes led compulsively to a belief in the existence and operation of beings or agents, not from any primitive perception of *them*, but from witnessing their *effects*. So true is this, and so irresistible is the propensity of the mind to endeavour to ascend from effects to causes, that perhaps mankind at large believe in the existence of as many

agents not cognizable to their senses, as they do of those that are. The ignorant believe in many more. In all parts of the world, and in every state of society, a dread of *invisible* agency haunts the uninformed.

From a thorough investigation of this subject, it might be made distinctly to appear, that, far from being disinclined to a belief in the existence of invisible beings, man has a natural and most powerful propensity to that effect—a propensity which makes as really a part of himself, as does a sentiment of hope, a taste for music, or a love of colours. From this source arises, as will hereafter more conclusively appear, an immense proportion of the superstition of the world.

Of the sentiment here advanced, illustration and proof may be abundantly adduced from various departments of natural science.

The medical world believes in the existence of a peculiar poison called marsh miasma. Yet by none of our senses is this substance perceived. Its *effects* alone, in the production of disease, testify to its existence.

The same may be said of the deleterious agents productive of influenza, measles, scarlatina, yellow fever, pestis vera, and every other epidemic disease. Physicians believe in the existence of them all, and yet are they cognizable to none of our senses. From their effects alone do we derive our knowledge of them. Nor do we ask for the aid of revelation on the subject.

Through no other channel do we arrive at a knowledge of the existence and influence of gravitation, electricity, magnetism, caloric, and even the principle of vitality itself. We have no sense to take immediate cognizance of those subtle agents. We simply witness, in

nature around us, their uniform effects. That these effects must have causes, we are compelled by the constitution of our intellect to believe; for man is essentially inclined to researches in causality. We inquire after those causes, but not being able to find them among *visible* agents, we conceive of them as *invisibles*, and attach to them for their designation the foregoing names.

Here is no revelation; nor is any requisite. Here is no *primitive invention* of names, to serve as means to conduct us to a knowledge of substances or things, to which they are to be afterwards attached as their appellatives.

A system of nominalism like this, could the human mind be led to the pursuit of such a fantasy, would be a gross perversion of the order of nature. It would be first to conceive of and form a *sign*, in the expectation of finding a suitable *thing* to be represented by it—to shape, in imagination, a shadow of a given figure and dimension, and then look for a substance calculated to produce it. It would resemble not a little the whimsical employment of the old bachelor, who amused himself by inventing names, and imaginatively attaching them, by the baptismal ceremony, to the several children which he expected to be born to him, after his marriage.

Nor is revelation necessary to give us a knowledge of any other invisible being, whose operations we witness. The same process of reasoning, united to the same propensity to inquire after causes, which leads us to a belief in the being and agency of invisible *material* things, can, with equal ease, conduct us to a belief in

the existence of *spiritual* things. It is necessary for us to ascend but one step higher in the scale of inquiry, and the object is effected. (*k*)

In contemplating the works of nature, man discovers a phenomenon, for which, by the utmost stretch of thought, he cannot account, through the influence of any *material* agent. He runs over all the properties of matter that are known to him, and finds them insufficient for the solution of the difficulty. Yet the phenomenon is an *effect*, and as such, must have a *cause*. At once, therefore, he *sancies* a cause, and immediately adopts it as an object of belief. This cause is something invisible—different from matter—possessing higher powers than matter—placed even beyond the bourne of what its discoverer means by the term *nature*. He, therefore, considers it *supernatural*, and denominates it *spirit*.

In this process of investigation, the number of spiritual beings supposed to be discovered, will be in the inverse ratio of the intelligence of the discoverer. The philosopher will find but *few*, and they will be *great*. Their influence will be extensive and their action powerful. They will be, according to circumstances, Demigods or Gods.

On the contrary, the man of civilization who is buried in ignorance, the unlettered barbarian, and the more uncultivated savage, will find many such beings; and they will be *small*—limited in their spheres, and feeble in their powers. They will constitute collectively that vast tribe of invisible and supernatural beings, whose existence is believed in by the ignorant of all countries, but more especially of those, in which science is but partially cultivated, or altogether unknown.

They will be the spirits of the fire, of the flood, of the air, of the tempest, of the thunder-cloud, of the water-spout, of the earthquake, of the volcano, and of such other phenomena as appear inexplicable to unenlightened man. Or they will be the hovering shades of patriots and ancestors, overlooking the concerns of their country and kindred.

By pursuing this inquiry to the requisite extent, widening progressively the sphere of his observations, generalizing, as he advances, on an ampler scale, and embracing in his view the unbroken uniformity that pervades creation, and the boundless power and wisdom that mark the movements and economy of the universe—by proceeding thus, man arrives at length, at a belief in the existence of one **SUPREME**, (*l*) all-powerful, and all-wise, the God at once of the philosopher and the christian. If this **GREAT FIRST CAUSE** be not as clearly and accurately depicted in *all* his attributes, as the God of written revelation, he will be much more sublimely and suitably represented in *some* of them.

But I am told that in this chain of nature, which I am attempting to construct, by which the philosopher is to climb to the footstool of Deity—to mount “through nature up to nature’s God,” a link is wanting, which can never be supplied, and without which the fabric is not only defective, but useless.

This link is the *work of creation*. We are told, Gen. chap. I ver. 1, that “In the beginning God created the *heavens and the earth*,” and it is asserted, that without such information, we never could have known that they were created—that we could have had no conception of creation at all; but that we should have considered

the whole material universe—the earth, the sun, the moon, the stars, and all they contain, either as *self-created*, or as *uncreated and eternal*.

It must be acknowledged, that with all the aid revelation affords us, our views on the subject of *creation* are exceedingly dim, defective, and unsatisfactory. To conceive of the production of a universe out of nothing, is to carry to its utmost limit our idea of omnipotence. (*m*) Still, as there is no contradiction implied in the act, we are compelled, perhaps, to acknowledge, that, in one sense of the term, omnipotence can achieve it.

We are told that the material universe, as exhibited to our scrutiny, presents us with no phenomena calculated to convince us that *creation*, i. e. *existing nature*, is an *effect*, and that we, therefore, have no ground or inducement to inquire after its *cause*. That although we see before us and around us, an *existing, organized, and well directed* universe, we cannot, from the mere contemplation of it, infer the existence of a *producer, an organizer and a director* of that universe.

When deliberately examined, and analysed with judgment, this proposition has much more the appearance of a *puzzle or conundrum*, than of a *solid*, or even a *serious argument*. While the superficial will deem it ingenious, the philosopher will pronounce it the fabrication of a sciolist.

On a subject so obscure and intricate as the present, nothing is more easy than to construct what may appear like an argument *in words*, and prove exceedingly difficult to answer, but which has no influence, *in fact*, either in strengthening conviction, or altering belief—which may captivate, *for the moment*, the

unthinking and the superficial, but makes no impression on the judicious and discerning. A production like this is a genuine *sophism*; and of this description do I consider the position I am examining. Whether I may be able, in the estimation of others, to refute it in words or not, I feel, as an original sentiment, satisfactory to myself, that it is fallacious. And such sentiment being in its character instinctive, will, if I am not mistaken, take possession of every one who will dispassionately and thoroughly investigate the subject.

No sooner has the human mind, by the easy and natural process described, arrived at a belief in the existence of *spiritual* beings, and of their superiority to *material* ones, than every thing material, certainly every material *phenomenon*, will be considered by it *an effect*. Spirit it will regard as occupying the *primary* and *governing*, matter the *secondary* and *governed* rank in existence. Whatever of matter, therefore, cannot be believed to be effected by matter, will be attributed to spirit.

That, from the principles which uniformly govern human inquiry, this will and must be the course of things, no one can doubt who is at all versed in the science of mind. No one will question it who is observant of occurrences that daily present themselves. Stronger still, no one will hold it dubitable who is attentive to the operations of his own intellect. Spiritual substance once conceived of and believed in, becomes immediately a source of reference for the solution of all difficult problems arising out of the phenomena exhibited by matter.

In contemplating the scheme of the material universe, even as far as it is unfolded to our view, a belief in

the mere act of *productive* creation (in simp'ler phraseology,) the calling of *all things* out of *nothing*, is not essential either to our perfect conviction of the being of a God, or to awaken in us a sentiment of piety and devotion. It is not necessary, therefore, to the defence and establishment of natural religion.

To effect our purposes, in these respects, all we look or wish for is, the attainment of the knowledge of a **GREAT SUPREME**, endowed with attributes worthy of adoration. And this can be much more certainly and suitably effected, by *solemnly contemplating* the government of the Universe, than by *curiously and hypothetically speculating* on the subject of its production. I denominate this a matter of hypothesis, not from feelings of disrespect towards the inquiry, but because it is known to be an *unsettled* opinion, even among the most learned and pious divines.

Creation, as interpreted by the followers of Maimonides, (*n*) is exclusively an act or achievement of *power*; and might, therefore, have proceeded as well from the *power* of a *malevolent* being, as of a *beneficent* one.

But *power* is not the attribute of God, which constitutes the object of acceptable worship—which cultivates and enkindles the best affections, and commands the unqualified homage of the heart.

The omnipotence of the Deity, apart from his other perfections, may deeply impress us with *awe* and *admiration*, *astonishment* and *fear*. But these are not the elements of *vital religion*.

Fear alone is a low and ignominious motive of action. The offerings to Heaven which it extorts, are fruitless—the forced and heartless *adulation* of a slave, not the

ameliorating and endearing *devotion* of the child. Of this latter and only valuable kind of worship, the genuine elements are feelings of *veneration*, *gratitude* and *love*. But *they* are awakened, and held in a state of habitual excitement, not by the omnipotence of the Deity, but chiefly by his wisdom, goodness, mercy and truth. But, with the mere *production* of the material universe, apart from its organization and government, those attributes have no immediate connexion. By their instrumentality the Deity could not *produce*; but, as already stated, by his *omnipotence* alone. It is from his *moral* attributes chiefly, that he is an object of worship—especially of that worship, which improves our nature, by cultivating the best affections of the heart.

Admit, if you please, that matter was *not* produced, but that it was *coeternal* with the director of the Universe. Whether true or false, the supposition neither robs the Deity of a single attribute, nor detracts from him; in the slightest degree, as an object of worship. He still wields and governs and modifies matter by his own laws, and at his own pleasure, and, therefore, retains his omnipotence untouched. He still configurates and endows it, and prescribes to it its destinies, and is still the benevolent parent and the bounteous sustainer of every thing that *lives*, and the wise and beneficent fashioner and *controller* of all that *exists*. To give to matter its properties, and lay it in subjection to its principles and laws, is as truly the work of omnipotence as to *produce* it.

Man, therefore, being dependent on the Deity for all he enjoys, is necessarily accountable to him, on the ground of his moral agency, for all he receives. And

of this accountability, the penalty, if forfeited, can be promptly inflicted; for the power to compound, fashion, and endow, necessarily presupposes an equal power to punish, decompound, and destroy.

Under this view of his relation to the systematized Universe, the Deity is as much an object of religious worship, as if he were its actual *producer*, as well as its omniscient constructor and beneficent governor.

But were I inclined to turn biblical critick, on the occasion, and carry the war into the dominion of my adversaries, I would be authorized in assuring them, that, on the score of the *actual production of substance*, there is as much difficulty and uncertainty in *revealed* as there is in *natural religion*. On that subject the Scriptures give no information that can be held conclusive. Here, as in many other instances, different interpreters of those *Sacred Writings*, not only construe them *differently*, but affix to them meanings directly opposite.

In the *Hebrew text* of the *Old Testament*, from which alone the true meaning of that work is to be derived, the term *Bura* is used between sixty and seventy times. (o) But in only one instance, out of such multiplied repetitions, is it made, either in the Greek, Latin, or English versions, to signify the *actual production* of substance. On every other occasion, it expresses, according to the best translators and criticks, some *modification* of substance *already existing*. And the variety of these modifications is not inconsiderable.

When, according to the English translation, Moses tells us first, that God “*created*” the Heaven and the earth, he employs the term *Bura*; and when he afterwards tells us that he *formed* certain living beings out

the existing substance of the earth, the word he uses is precisely the same.

Wherefore, I beg leave to ask, are interpretations so different, thus affixed to the same word? If there be for this change any reason except the mere *opinion* of the translator, I am altogether unable to discover it, and will feel obliged by any one who will instruct me on the subject.

When it suits one hypothesis, the word *Bura* signifies to *produce out of nothing*. . When it better suits another, it means to compound, fashion, or modify something already produced. A third hypothesis gives it a third meaning, until, by its flexibility, ceasing to have any permanent meaning at all, it becomes a mere "nose of wax," obedient to the fancy of him who would mould it—a perfect cameleon, assuming the hue of every notion that may be concieved with regard to it.

Let me entreat the adversaries of *natural religion*, then, to be cautious how they attempt to disprove or in any way discredit the truth and importance of *it*, by opposing to it an objection to which *revealed religion* is equally liable.

But, in reality, when fairly considered, this uncertainty does not, in the slightest degree, detract from the value of *any religion*, either as a system of moral and divine instruction, or as a rule of enlightened and practical piety. Be the question settled as it may, the Holy Scriptures will still continue, as they are at present, an unerring guide to Heaven and happiness.

For I repeat, that, provided our views and feelings, in relation to the *government* of the universe, be correct, our notions respecting its *production* cannot material-

ly affect either our morality and piety *here*, or felicity and standing *hereafter*. Nor is this assertion at war with any fundamental principle or precept of either revealed or natural religion.

Subtle and intricate as this subject is, I indulge the hope, that, by a fair analysis, it may be yet more clearly and satisfactorily presented to the mind.

That nothing can be *self-created*, constitutes, in the abstract, one of the first and most indubitable points of human belief—a point in which every one instinctively acquiesces.

Added to the force of this *general* sentiment, man feels a perfect consciousness that *he*, at least, did not create himself. Besides, he sees perpetually one generation proceeding from another, as effects from their causes. Persuaded that his ancestors resembled precisely himself and his contemporaries, he feels a conviction that they also were equally incapable of creating themselves. *Their* production, then, he is compelled to consider as really an *effect*, as that of his contemporaries and himself, which he *knows* to be such. The cause of this effect he is solicitous to ascertain, not only from his constitutional propensity to *inquire* into causes, but from the fact, that, in the present case, a knowledge of the subject, involving, as it does, a correct acquaintance with his own origin, is personally interesting to him.

But no material agent can be found capable of having given existence to the human race. This earth could not have done it, for *it* has evidently but a limited and secondary agency even in the *perpetuation* of the race. Nor could the effect have been produced by the more remote and feebler influence of the sun, the moon, or

any of the other celestial bodies. To the agency, then, of some invisible and more powerful being, denominated *spirit*, must the origin of man be necessarily attributed—to the agency of something whose effects are cognizable, but whose substance is concealed.

By a similar process of inquiry and reasoning, applied to various tribes of inferior animals, are we forced to assign to them a similar origin. *Their* existence is also an *effect*. They could not have originally produced themselves. Neither the earth nor the heavenly bodies could have produced them. To invisible and spiritual agency, therefore, must their origin be referred.

Without the least aid from revelation, then, a belief in the creation of man and other animals can be easily attained. This rule applies alike to the inhabitants of the air, the ocean, and the land.

Were we to consider this earth only in the light of a mere insulated mass of brute matter, apart from its structure, connexions, and dependencies, it would puzzle us, perhaps, to form any rational and satisfactory opinion on the subject of its origin. Thus viewed, it would have no more character than a simple original particle of matter, detached from all dependencies and alliances; and, from its apparently inert and unchanging condition, might probably be supposed to have existed from eternity in its present condition.

But altogether different is the aspect it presents, when we contemplate it as a component part of an organized universe, its connexions, dependencies, and perfect adaptations in full display before us. It is then that we discover in *it*, and the system to which it belongs, manifestations of design, and evidences of infinite intelligence,

power, and goodness. It is then that we recognize, in every feature of it, the traces at once of a builder and governor. (*p*)

It is a primitive truth, and must, therefore, command universal assent, that any structure or system of matter, which exhibits, in its arrangement, marks of design, intelligence, and power, is necessarily an *effect*. It is the effect or production of the intelligence and power which it thus exhibits. But intelligence and power are nothing but *attributes*, and presuppose a *subject* to which they belong. This subject, then, is the creator of the system in which they appear. To predicate of *chance*, either the manifestations of design, or the arrangements of system, would be self contradictory.

By this test, which may be pronounced an *infallible* one, let us briefly examine the globe we inhabit, and see whether it be the offspring of creation or not.

That immense *power* is concerned in the economy of this earth, is clearly demonstrated by the vastness of its size, multiplied into the great velocity of its motion, both on its own axis and around the sun; by the tempests that sweep and devastate its surface; the earthquakes that convulse and sometimes shatter its solid frame; and the volcanoes; that burst occasionally from its interior. To these, as giving further manifestations to the same effect, may be added, the thunder storm and the hurricane, the cataract and the raging of the tempest-beaten ocean. These phenomena, I say, are all declaratory of the existence and exercise of stupendous power.

That marks of consummate *wisdom* are displayed in the economy of the earth, both as a separate orb, and

in its connections with the system to which it belongs, every view that can be taken of it proclaims.

When contemplating its exterior, the first thing that strikes us is its globular form, which, for sundry reasons, is the best that infinite wisdom could bestow on it, as being most perfectly suited to its present economy. By giving to it greater compactness and strength, it fits it better than any other figure, to move swiftly and equably through space, and to sustain, without derangement, the stupendous velocity of the motion it performs.

Were it bounded by any other than circular lines, it would receive with much less uniformity, than it does, the rays of the sun; and, under no other figure, would all the parts of its surface be equidistant from its centre. In this state of things, the most projecting portions would be subject to a much more intense degree of cold, and a greater inequality in the density and pressure of the atmosphere, than our loftiest mountains, or most frozen regions, at present experience. A much larger portion of it, therefore, would be uninhabitable by man, than is the case under its existing condition and figure.

In the compound motion of our globe, *on its own axis, and around the sun, in the course of the ecliptic,* we behold a further manifestation of consummate wisdom, in relation to its reception of heat and light, and its retention of its place in the solar system. For the attainment of these ends, so essential in the economy of sublunary things, no *other expedient* which omniscience could devise, would be equal to that which it has already instituted.

Check the diurnal motion of the earth on its own axis, and only half of its surface will be cheered and warmed by the solar beams, the other half remaining in endless darkness, and perpetual winter. In this state of things, each portion would suffer, perhaps, in an equal degree. While that next the sun would be scorched and dazzled by an excess of eternal heat and light, the opposite side would be no less injuriously affected by a monotonous duration of cheerless gloom and pinching cold.

Arrest the earth in its ecliptic journey around the sun, and the vicissitudes of the seasons, with all the pleasures and advantages resulting from them, will immediately cease. As respects the present vegetable kingdom, there will be no longer either winter or summer, seed-time or harvest, but a condition of things equally nameless and lifeless will succeed.

In relation to us, the entire economy of nature will be changed, and our globe must either be stocked with new races of inhabitants, both vegetable and animal, adapted in their constitutions to its new condition, or converted into a dreary, tenantless waste.

Nor will the disaster resulting from this altered state of sublunary creation terminate here. The centrifugal influence of the earth's motion in its orbit being destroyed, we shall fall under the entire control of gravitation, which will hurry us into the fiery vortex of the sun. To what extent this catastrophe might affect the balance and economy of the solar system, or even of the universe itself, I leave to mathematicians and astronomers to compute.

A distinguished favorite of the Muses, whose pen-

tration, extent of research, and varied attainments, as a philosopher, were scarcely inferior to his genius, as a poet, has thus expressed his sentiments on the subject.

" From nature's chain whatever link you strike,
 " Tenth or ten-thousandth, breaks the chain alike.
 " And if each system in gradation roll
 " Alike essential to the amazing whole,
 " The least confusion but in one, not all
 " That system only, but the whole must fall.
 " Let earth unbalanced from her orbit fly,
 " Planets and suns rush lawless through the sky,
 " Let ruling angels from their spheres be hurl'd,
 " Being on being crush'd, and world on world;
 " Heaven's whole foundations to their centre nod,
 " And Nature trembles to the throne of God."

The division of the earth into dry land and ocean, is another arrangement equally wise, and suited to its general purposes in creation. Without this it could not receive, in rains, and dews, and other modes of precipitation from the heavens, the amount of waters, which, as a residence for animals and vegetables, it requires.

In contemplating the general provisions of nature for giving to the various portions of our globe the moisture they require, we are impressed with sentiments of admiration and delight, at discovering one of the most exquisite systems of design and adaptation, that wisdom can frame, or imagination conceive.

In the fathomless ocean we behold an inexhaustible reservoir of supply; in the atmosphere, the electrical fluid, and the sunbeams, machinery for elevating the waters in a vaporous condition; in currents of wind, the provision for wasting them to distant regions; in the varied temperature of the atmosphere in different places, aided again by the action of the electric fluid, and the attraction of mountains and hills, the means of condensing them into clouds, and precipitating them to

the earth in rains, 'hails, and snows; in springs and rivulets and rivers, their escape from the earth after having ministered to the wants of the animal and vegetable kingdoms; and in the great inclined plain extending from the loftiest to the lowest situations on the earth's surface, the mechanism for conducting them back to the ocean.

Remove but one of these requisites, and the earth will be no longer properly watered. Take away the ocean, the supply will be cut off; the atmosphere, the waters will be elevated in vapour no more; the winds, they will not be wafted to remote regions, that every place may receive them in requisite abundance; the variety in the temperature of the atmosphere, the electric fluid, and the attraction of elevated points of land, they will not be condensed into clouds, and precipitated in rain or any other form; the elevation of the ground into hills and mountains, and they will not be reconveyed to the ocean, but, stagnating every where, will cover the earth with lakes and morasses, and render it uninhabitable.

Marks of wisdom, worthy of a God, we also discover in the perfect and exclusive adaptation of the inhabitants of the earth to the different elements in which they reside.

Fish, exquisitely fitted to respire, live, and act in the waters, become immediately inefficient and die, if removed to the land.

From their structure, powers, and modes of life, quadrupeds are destined and peculiarly qualified, to reside on dry land; while, from their configuration and lightness, the strength and durability of particular mus-

cles, and their covering and enginery of feathers, the adaptation of birds to be inhabitants of the atmosphere, is equally perfect.

Connected with the feathered race, are other important and beautiful aptitudes, according as they are aquatic or attached to dry land, swimmers or waders, birds of prey, or dependent on other modes of subsistence.

The aptitudes, moreover, between the appetites, propensities, and different structures of animals, whether quadrupeds or birds, are striking and beautiful.

From the swiftness of their movement, the peculiar form of their teeth and claws, and the power of the muscles, that bring them into action, beasts of prey, that delight in blood, are admirably qualified for the business of slaughter. Of this we have exemplifications sufficiently striking in the lion and the tiger.

Animals again that crop the pasture, or subsist on any other description of vegetable food, are equally fitted, in structure and intellect, for their destined modes of life. Examples of this we have in the horse, the ox, the goat, and the sheep.

Give to the ox the taste and propensities of the lion, and he will die of hunger, from a radical disqualification, in form and action, to arrest other animals and make them his food. Transfer to the lion the taste and other mental qualities of the ox, and the issue to him will be equally fatal. Admit that he were even to crop and swallow grass, his digestive organs would prove unfit to convert it into nourishment; in consequence of which, it would prove deleterious in its action on his system. He would die, therefore, from the effects of disease, superadded to a deficiency of suitable aliment.

implant in climbing quadrupeds the propensity of birds to fly from tree to tree, without bestowing on them also the form, feathers, and muscular powers, to fit them for the flight, and they will perish in the attempt. And give to land birds a disposition to trust themselves to the water, without conferring on them the requisite aptitudes for that element, and they will inevitably be drowned.

In relation to his capabilities to sustain himself, as lord of creation on earth, man also exhibits a perfect aptitude between his corporeal and intellectual qualifications. In confirmation of this, change either of them, and he is no longer fitted for his august situation.

His intellect remaining as it now is, give to him the corporeal fabric of the horse, and, abundant as it is in animal vigour, he will be unable to accomplish any one of his schemes calculated for the attainment of meditated empire. Or, his structure of body remaining unaltered, exchange his intellect for that of the ox, and, with all his corporeal powers to execute, he will meditate schemes of ambition no more.

But, with the intellect he now possesses to *conceive*, and his hand and general structure of body to *carry into effect* his projects of rule, he is exquisitely fitted to stand at the head of sublunary creation.

Had I time and capability to analyse thus the organized universe, consisting as it does of matter and spirit, I cou'd satisfactorily demonstrate, that it is one unbroken system of aptitudes—that it is characterised throughout by marks of design, intelligence and power—that each of its parts is specifically adapted to the evolution of the others, and that, in all their qualities,

its numerous subdivisions are in harmony with the whole.

Nor are goodness and benevolence less strikingly and extensively manifested, in the arrangement and economy of this mighty fabric. Examine it throughout, composed as it is of suns and systems, beyond the powers of man to enumerate, with their myriads on myriads of intellectual and immortal inhabitants, swelling to the very verge of infinity itself, and, notwithstanding occasional examples of suffering, pleasure and happiness will be found to preponderate over misery and pain, in a degree commensurate with the illimitable scheme of things through which they are diffused. And all this appears conclusively, to be the effect of provisions intended for the purpose—Provisions, in the preparation of which we perceive as clearly the presence and operation of intelligence, benevolence and power, and in the contemplation of which we are led as irresistibly to a belief in the existence and agency of an intelligent, good, and powerful CAUSE, as if the knowledge of it had been revealed to us by a voice from Heaven.

The *unity* of God we satisfactorily infer from the unity of design and harmony of movement in the organized universe. Nor is a knowledge of his attribute of *mercy* denied us. To him we naturally ascribe, in infinity, whatever of good, amiable, or praiseworthy, we feel in ourselves, or discover in any of the productions of nature.

But our consciousness testifies to our own *disposition to clemency*, our conscience applauds whatever act we perform in obedience to it, the manifestation of it in others commands our approbation, and we witness with

abhorrence acts that proceed from an opposite sentiment. To the Deity, therefore, we look as the fountain of mercy, whose overflowing and innumerable streams, mingle and co-operate with those of his other attributes, in carrying healing and happiness to every portion of the universe he has formed.

Such is the evidence, which, in the time allotted me for this address, I have been able to collect, from a hasty survey of the globe we inhabit, and the system to which it belongs, to establish the belief, that they exhibit themselves unequivocally, not as the *offspring of accident*, but *design*.

Is it possible, then, for any one, lettered or unlettered, civilized or savage, to look abroad through nature thus harmoniously ordered, with an eye of intelligence, and a disposition to observe, and doubt that it is the effect of a cause boundless in the attributes it so irresistibly manifests? Can any one do this, and still declare that without the aid of a revelation *in words*, man is unable to read and understand the lessons of a God in the volume of his works?

Has the Deity, notwithstanding the infinity of all his perfections, operated in a manner so feeble and unskilful, that he is obliged to label the productions of his hand, to render their origin and intention intelligible?

"This is the *man*, and this the *horse*," appeared over the work of a *sign-daubing* painter, to distinguish his representation of the biped from the quadruped. But not so with the great and accomplished artist. His productions stand *self-interpreted*. Not so, in a particular manner, with the *divine artist*, whose pencil has emblazoned the canvass of creation, and whose works speak

a language as audible, and intelligible, and impressive as his words.

I repeat, it is a primitive truth, which no one will venture to doubt or contradict, that whatever *material structure* or *system* manifests in its combinations, design and intelligence, is essentially *an effect*. It is the work of some intelligent agent, operating to a foreseen and pre-meditated end; and such is the decision of the common sense of the world. A contrary decision, could such be formed, would be preposterous.

Let the structure examined be a steam-engine or a watch. The adaptation of part to part being discovered, the aptitude of each to accomplish some design being recognized, and the effect of the whole combination being perceived, in the certain attainment of the object proposed, who will cherish even a momentary doubt, that the machine is an effect—the work of an able and disciplined mechanician? Or who will venture to contend, that a *revealed* account of it is necessary to make known to the enlightened examiner of it, its origin and uses? He who, under these circumstances, could attempt to play the sceptic, would subject himself to the suspicion of a deranged intellect.

But, in grandeur of design, elegance of workmanship, adaptation of parts, and perfection of the whole, what is the structure of any apparatus of human invention, compared to that of the universe of the Most HIGH?—A machine so magnificent and harmonious, so perfect and durable, that without deterioration or error in movement, repair of materials or improvement of plan, and without the slightest interference of the hand that erected it, it will continue in play, the admiration

and delight of intelligent existence, while being shall endure, unless its constructor shall otherwise direct.

Shall man form a *time-piece*, then, and be recognized in his work, *without* revelation? And shall the Deity construct the *orrry of creation*, and *still be concealed*? —still require an interpretation in words to be affixed to his labours? Shall he mark with his footsteps the dry-land and the flood, and scepticism have the hardihood to endeavour to efface them? Or shall he write his name in the **Heavens** in stellar characters, and man presumptuously deny it a place there; or attempt to obscure it by the mist of sophistry?

Let no one *degrade himself* or *scandalize his God*, by propagating such sentiments, or engaging in such efforts. For he that cannot read the existence and operations of a Deity in the fabric of the universe, and in the admirable structure of his own system, or feel them in the exercise of his own mind, proclaims himself defective either in body or in intellect.

When all nature addresses man in the same language —through the brightness of the day, the glimmerings of the night, and the grateful vicissitudes from the one to the other—through the birds whose home is in the air, the beasts that select the forest for their dwelling, and the fishes that find their food and their pastime in the flood—through the waves that roll, the streams that run, and the exhalations that rise and mantle in the heavens—through the winds that blow, the clouds that threaten, the lightnings that glare, and the rains that fall—through the dry-land and the morass, the valley, the champain and the elevated ground, and even through his own form and his own feeling—when

to each of these objects nature has given a tongue, and proclaimed with them all the existence, the attributes, and the operations of a God, it is monstrous that man, whom she thus addresses, should doubt or deny—that he should insultingly demand a revelation *in words*, to make amends for the insufficiency of the *works* of creation—that he should virtually say to his divine creator, “The universe you have formed is so obscure in design, and so defective in execution, that it furnishes no knowledge of its author; make yourself known, therefore, in articulate sounds, or I shall not be able to recognize your existence.”

Conduct, I say, like this, is in its nature monstrous, and in its tendency offensive to the MAJESTY of Heaven, beyond what any language of mine can express. Nor is it much less so to allege, that although the Deity has thus deeply and indelibly imprinted on the tablet of the universe himself and his attributes, he has done it in vain, in consequence of having formed man, his *chef d'oeuvre* on earth, with such defects and unfitnesses, that he is unable to perceive them, and to profit by the discovery.

Such, gentlemen, are my views of the general character of the religion of nature, and such the foundation on which to me it appears to rest—a foundation, as wide as the limits, and as stable as the everlasting fabric of creation, and whose soundness neither the demurs of the sceptic, the denunciations of the fanatick, nor the trick of the sophist can ever affect.

A comparison between the aggregate merits of *natural* and *revealed* religion, it is neither my province nor my purpose to institute. That they are both excellent.

both necessary, and, as far as the *former* extends, perfectly coincident with each other, in the views they disclose, and the rules of practice they inculcate, cannot be denied, because they are equally of *divine authority*. Let them both, therefore, be cultivated, as sending forth reciprocally the lights that are required, and operating as salutary checks on each other.

When the everlasting welfare of man is at stake, there can be neither too many lamps to direct his footsteps, too many correctives of his erring propensities, nor too many incentives to urge him to his duty. If he attain his end by all the aids which the books of nature and of written revelation conjointly afford, he is amply rewarded for his trouble and toil in the examination of both. I shall only add, that if *revealed religion* be most abundant in practical precepts, the *religion of nature* is the most sublime, and by far the richest in philosophical truths. The *former*, being never intended by its divine author as a *fountain of science*, simply instructs us in the road to Heaven, while the *latter* enlightens and enchants us by the way. Hence the one is better adapted to *mankind at large*, while the other has been denominated the *religion of philosophers*.

In closing this address, which the extent of my subject has inordinately protracted, permit me earnestly to recommend to you, while you cultivate with assiduity the *religion of nature*, not to jeopardize your own welfare, nor give cause of offence to pious worshippers, by a wilful neglect of the rites and ceremonies of the *religion of the Bible*.

END OF MEMOIR I.

NOTES TO MEMOIR I.

Note (a) page 10.

The truly enlightened and liberal, who always prefer the *substance* to the *shadow*, the *thing done* to the *manner of doing it*, are friendly, in the abstract, both to *religion* and *religious worship*. But they are neither intolerant *sectarians*, nor stickling *formalists*. Provided offerings of devotion be *the incense of the heart*, they consider them likely to be accepted, attaching but little weight to the circumstances of *time, place, or form*.

Hence physicians professing no very decided preference for *any* one of those sects in religion, whose tenets accord with the word and will of God, as made known in the *Holy Scriptures* and the *Book of creation*, all sects are inclined to disown and often to denounce them. For it is to be lamented, that "he who is not in all things with us is against us" is too generally the disorganizing language of sectarianism.

Physicians thoroughly educated and extensively versed in the science of nature, being liberal and catholic, in reference to religion, friendly to every denomination of christians, but particularly wedded, perhaps, to none, are too frequently slandered by all denominations, and pronounced abettors of irreligion and infidelity.

Such is the iniquitous character of party spirit, whether it relate to the affairs of this world, or those of the next. *Neutrality* being its detestation is always denounced by it.

Note (b) page 13.

Those who, in the sickening cant of the times, declaim against *nature*, as the *author of crime*, are not only violators of truth, but slanderers of the Deity.

Nature *perverted, corrupted, and abused*, leads to the perpetration of crime. But the same thing is true of the *abuses of religion*. Nature, *in her purity*, is the only true representative of her *immaculate Author*. Whatever accusations, therefore, are preferred against the *former*, are, at the same time, virtually preferred against the *latter*.

Note (c) page 14

I know it is contended that the offering of expiatory sacrifices is a mode of worship necessarily of divine origin, and that it could not have been instituted, on any views of the Deity derived from nature.

That this opinion is fallacious, might be clearly demonstrated, were time afforded me to subject it to analysis.

The practice of men, in all countries and ages, in their relations both to Heaven and to each other, satisfactorily evinces, that a belief in the fitness and efficacy of oblations to avert resentment, and secure an exemption from dreaded punishment, is an original sentiment of the human mind. It would seem to be rather an instinctive feeling, than an impression derived from external sources.

On the termination of a deadly feud, the native chiefs of Scotland, as well as those of other nations, have been in the uniform habit of exchanging presents.

On the close of a sanguinary struggle in arms, the Indian presents to him who was lately his adversary, the pipe of peace, or bestows on him some more valuable present.

By civilized and polished individuals, conciliatory entertainments are often given, and, on sheathing the sword, the courts or leaders of powerful nations, do homage to each other by mutual and costly largesses. Nor is it uncommon for the weaker party to purchase a peace by valuable concessions.

From these practices, so universal among men, the attempt to propitiate the Deity by precious offerings, is

a transition as natural as it is slight. Mankind judge of him as they do of each other; and attempt to propitiate him, as they would themselves be propitiated.

Nor does this consideration lessen, in the smallest degree, the worth of sacrifices. On the contrary, it represents them as the more estimable and important. When the precepts which we receive, as the written commands of God, harmonize with the constitution and native feelings of our minds, the evidence of their truth is the stronger, and a punctual obedience to them the better secured. It is not true that divine injunctions are valuable in proportion as they run counter to native feeling.

Note (d) page 14.

The morality of nature, when correctly understood, and faithfully interpreted, is as pure and practical as that of revelation. If pagan nations have not fully profited by it, neither have they by *physical* knowledge.

The defect, then, is not in *nature*, but in *themselves*. They have misinterpreted nature and committed excesses on her. And so do christians misinterpret written revelation, extorting from it moral and theological dogmas, which it does not authorize. They, moreover, push it to points of great extravagance, and by that means, vitiate certain practices which are in themselves right; and which, when duly regulated, revelation countenances.

In these respects, nature and revelation are equally abused. But, from the *abuse* of an institution, let no one decry and undervalue its *use*. On this principle, revealed religion would suffer more than any human establishment. For the abuses it has sustained and is daily sustaining, are beyond those presented to man from any other quarter.

All the author contends for is, that, as far as she goes, *nature*, correctly interpreted, leads to truth, to virtue, to piety, and to happiness. To deny this, is to slander

the Deity. It is to call his works imperfect, and virtually assert, that he has hung out, in nature, artful decoys to allure men to vice.

Note (e) page 17.

"Unspeakable" because the Deity is, in every thing, *infinite*, and language, which is of *human* invention, *finite* in its powers. Had HE formed a language infinite in expression, by which to communicate a knowledge of himself, it would have been unintelligible to the limited capacity of man.

He has, therefore, condescended to speak to man in his own language, as the only medium through which he could be understood..

To represent human language as equal in compass and force of expression to the works of nature, would be to place man on a level with the Deity. Let the fanatic who can neither read nor prize the *volume of creation*, beware of such presumption.

Note (f) page 18.

To realize this view of things, in all the sublimity and grandeur that belong to it, let any one, capable of reflection and accustomed to analysis, contemplate the starry heavens, when the atmosphere is serene, and no clouds interpose to obstruct his vision, or limit his prospect.

Having numbered the magnificent array of fixed stars, that present themselves to the *naked* eye, let him remember, that each of them is a central sun, with a system of *secondary orbs*, and sub-systems of *satellites*, revolving around it; many, perhaps most, of them, immeasurably larger than this earth; and that the whole of them are inhabited by rational, accountable, and immortal beings.

Let him further recollect, that all he beholds, vast and overwhelming as the scope of it may appear to him, occupies but a *speck* in the organized universe—a *mere point* in the vestibule of the temple of creation. That

the telescope, even with its present limited powers, brings to view millions of other central suns, surrounded by their systems of peopled worlds, and that there still exist in the immensity of space, undescried by the eye of astronomy, millions on millions of other similar suns and systems, whose very light, with all the inconceivable velocity of its motion, has not, since the period of their location in the spheres where they revolve, had time to reach this distant planet. Add to this, that from the centre to the boundaries of peopled space, unbroken order, harmony, and happiness every where prevail.

Having exhausted his powers, in thus attempting to compass the physical and moral magnificence of the universe, let the individual declare, whether *human language* can express, or imagination conceive, one millionth part of the power, wisdom, and goodness of **HIM**, who organized and sustains and governs the whole !!

If they cannot, then am I indubitably privileged to allege, that the manifestations of some of the attributes of God, through the *revelation of his works*, is more magnificent and impressive than that by *written revelation*.

There is yet another point of view, in which the religion of nature presents us with a scheme of things unspeakably magnificent. Not confined to any *part* of peopled space, it is the common inheritance of the *whole* of it.

The *universe of matter*, denominated by the pious and eloquent Dr. Young "The elder Scripture" constitutes a volume intended to be read by the *universe of MIND*.

To the erring inhabitants of this earth, a written revelation was necessary. But to us alone it is probably confined.

To the intelligent beings attached to the innumerable millions of orbs, that roll through space, from its centre to its confines, the book of creation, presented in

the hand-writing of Deity himself, which nothing can interpolate, counterfeit, or change, may be alone sufficient to communicate to them the requisite knowledge of its *divine author*, and to instruct them in their worship of him.

A *peculiar written revelation* is suited only to a *peculiar* state of things. That state is probably limited to this earth. But the *revelation of nature*, possessed of *universal* aptitudes, is calculated for the instruction and amelioration of intellect wherever it exists.

This catholic, delightful, and magnificent conception of things, is calculated to render us not only more enlightened and liberal philosophers, but more pious, grateful, and adoring worshippers—more intelligent men, and better christians.

Note (g) page 27.

It has been alleged by many writers, that the dispersion of the Jews has been the means of diffusing the knowledge of a God among the inhabitants of our globe.

That that people communicated to the nations in which they found asylums, some information respecting the *God of Israel*, is no doubt true. But it is equally so, that, in all their wanderings, they did not find a community or tribe of the human family, which did not believe in a God of its own before their arrival.

On the subject, therefore, of a belief in the *existence* of a Deity, the dispersion of the Jews had no bearing. To modify the opinions of nations as to his *character*, is all that that event could effect.

Note (h) page 27.

The *various* families of fossil remains found by geologists, at different depths below the surface of the earth, and evidently deposited in their respective strata at different periods, cannot be accounted for in any other way, than through the agency of as many deluges; not, we presume, universal ones; but sufficiently extensive to

constitute memorable epochs in the history of certain parts of our globe.

These circumscribed inundations are neither to be confounded with the universal deluge, recorded by Moses, nor offered as reasons for discrediting its existence. A belief in the existence of all of them may be honestly entertained.

Note (i) page 28.

"It were better, says Bacon, to have no opinion of God, at all, than such an opinion as is unworthy of him; for the one is *unbelief*, the other is *contumely*; and certainly superstition is the reproach of the Deity." Essay 17th.

Note (j) page 31.

When the author employs the term "*creation*" as expressive of his own views, he means *formation* out of substance *already existing*. In relation to no other meaning, as affixed to that term, is he to be considered as expressing positively either his assent or dissent.

By the term "*Creator*," he, in like manner, means the *constructor* of the universe, not the actual *producer* of substance. But he repeats, that he is not to be charged with the *denial of such production*.

Note (k) page 36.

The very names we bestow on spirit and its operations, afford conclusive proof that we attain all the knowledge of them we possess, by the process of inquiry, which is here described.

By the exercise of our reflecting powers, we form a conception of the substance, and then express it by a suitable term. In a process the *reverse* of this—to form names first, and then search for things to be signified by them, the human mind has never yet engaged. Nor can it seriously engage in it, until its nature shall have been changed.

The better to realize the absurdity of such a measure, let any one deliberately make the attempt, and

he will find himself foiled in every effort. He will perceive that he is working as directly *against nature*, as if he were attempting to make gravitation act from the earth's centre, instead of *towards it*.

Note (l) page 37.

It is not true, as certain declaimers confidently assert, that the *religion of nature* necessarily leads to a belief in polytheism. That effect arises from the *abuse* of it; and that abuse, from *ignorance*, and a *defective examination of the material universe*.

The ancients were polytheists, because they were unacquainted with the *science of nature*, particularly astronomy, natural history, and chemistry. They were ignorant of that exquisite *harmony*, and *unity* of design, which pervade creation, and, *when correctly understood*, testify as clearly to the unity of its author, as revelation itself. To assert the contrary of this, is to pass a slander on the Deity, by presumptuously maintaining that he has *contradicted himself*—that he has spoken one language in *his word*, and a *different one* in his works—that in the *former*, he has declared himself *one*, and in the latter *many*. In *both*, his declaration of his unity is alike explicit, and alike emphatical.

Examine, with attention, the organization of the heavens. The bodies that compose them, being all *spheres*, are *one* in figure. In organization they are also *one*, being all assorted and arranged in systems on the *same principles*. In relation to their scheme of giving and receiving light, entire *unity* prevails among them, the *central* orbs being the *sources* of that emanation, and the *exterior* ones its *recipients*. Revolving, as they do, on their own axes, and around common centers, the movements they perform are likewise *one*. And, as far as, from our knowledge, we are privileged to speak of them, they are *one* in their aptitudes as places of abode for *living beings*. We rationally, therefore, infer, that they are *one* in being *peopled*.

Descend from the heavens to the globe where we

dwell, and contemplate the uniformity of design and workmanship, which characterizes, so strikingly, its living inhabitants. When considered in their rise, their progress, and their end, their structure, their endowments, their action, and the materials which compose them, they present the aspect of *one great family*, descended from a *common parent*, directed by a *common governor*, and flourishing under the bounties of a *common benefactor*.

Let any one *of intelligence*, take this simple view of things, and, without prejudice, speak in obedience to the impressions it will produce, and if he does not declare that it is hostile to the puerilities and corruptions of polytheism, and that it leads directly, and irresistibly to a belief in *one creation* and *one God*, then will I resign the controversy, and agree that the religion of nature shall be expunged forever from the circle of the sciences, and denounced as a demoralizing system of infidelity.

But if, on the contrary, such should be the issue of the examination proposed, then shall I expect to hear no more of empty declamation and malignant misrepresentation, directed against those who honestly and conscientiously believe in the truth of the religion of nature—who feel a conviction which they cannot resist, and which their conscience itself *forbids* them to resist, that God *can speak* and *has spoken*, not only by the prophets whom he has inspired, but by the universe which he has constructed.

Nothing but ignorance or dishonesty can induce any one to draw from the polytheism of the *uninformed*, whether they be ancients or moderns, arguments against the natural religion of the *enlightened* and the *philosophical*. As well may narrow minded declaimers inveigh against the astronomy and chemistry of the *present day*, on account of the corruptions which degraded those sciences in *former times*.

Let the world become more enlightened, and preju-

dice pass away, and then will it be universally acknowledged, that natural and revealed religion are alike true, and that they go hand in hand, with that harmonious march, which characterizes all the institutions of God, in conducting man to heaven and happiness.

Notwithstanding any seeming admission to the contrary in this note, the ancients were not *polytheists*, in that gross and unqualified meaning of the term, which is generally affixed to it.

Although they were believers in the being and ministry of many inferior divinities, they admitted the existence and superintendence of ONE SUPREME, the great *arbiter* of the Heavens, as well as of the earth, whom all the others were compelled to obey.

In their gradations of rank, the offices they performed, and the worship they received, the minor Deities of the ancients were, in no small degree, analogous to the angels of the moderns. Nor is saint-worship less common now, than was the worship of household gods in former times.

Let cavilers beware, then, of denouncing the religion of *nature*, on account of a charge, from which that of *revelation*, as practised by many christians, is not exempt.

Note (m) page 38.

The term “omnipotence” is differently understood by different interpreters of it.

Some understand by it a power equal to the organizing, sustaining, and governing of the present universe, exactly as it is, without being necessarily adequate to any thing greater. Others again contend, that, by the omnipotence of the Deity, is understood a power capable of constructing, supporting, and directing, innumerable universes of the same description, or even of a character infinitely superior.

Without entering into the disquisition himself, or expressing any decided opinion in relation to it, the author will only observe, that, as far as he has attended to

the subject, the weight of authority appears to countenance the former interpretation. That the *omnipotence* of the Deity means, *the amount of power put forth in the establishment of the universe*, and nothing more. We can judge of power only by its effects.

The *works* of God would seem to be the best comment, not merely on his *power*, but on most of his other perfections. It is neither unreasonable nor irreverent, to allege, that his wisdom and goodness operating on his power, induced or rather *compelled* him, to make things on a scale as grand and sublime, as beautiful and perfect, as he was able.

Note (n) page 40.

"The Hebrew word *Bura* (Gen: I. 1.) rendered "crea-ted," has, chiefly on the authority of Maimonides, been considered as implying what theologians call an *absolute creation out of nothing*. But this, it has been alleged, is not the appropriate meaning. It rather means to *fashion, form, and decorate*, a matter already existing; and in this connexion especially, it means to retrieve from a state of desolation, and to embellish this little spot of earth, so as to render it fit for its inhabitants. In this limited sense God is afterwards (Chap: II. 7.) said to have *created* man, not out of *nothing*, but out of the *dust* of the ground." Vid. Rees's Cyclop. Art. CREATION.

Again, under the same article, "Upon the whole, we may observe, that it seems to have been the current opinion among the ancient Jews and earliest christians, that the world was created by God of pre-existing unfashioned matter. The matter of which the earth was created, or rendered a habitable world, was "without form and void," or a desolate waste, or in a state of desolation; that is, as some have supposed, a pre-existing earth, reduced by some awful calamity to a chaotic state."

Again. "The word *Bura* appears to have the same meaning, and, if etymology be regarded, to be the self

same word with the Latin *paro*, (to prepare;) and it is so rendered by Theodotian in Greek, *eloimasai*, Ezek. xxii. 19; and by the Chaldee Paraphrast. Josh: xvii. 15.

Note (o) page 42.

As far as the author has looked into the subject, the following are the only places, in the Old Testament, in which the word *Bura* is found.

Gen: 1. 1. 27. 27—2. 3. Deut. 4. 32. Isai: 40. 26—Jer: 31. 22—Isai: 4. 5—Mal: 2. 10—Isai: 41. 20—45. 18—Gen: 5. 2 —Psal: 89. 47. Gen: 6. 7.—Isai: 45. 12—54. 16. 16. Isai: 43. 7.—45. 8—42. 5—45. 18—40. 28—43. 15—57. 19—65. 17. 18. 18—45. 7. 7. Amos 4. 13. Isai: 43. 1. Eccles: 12. 1. Gen: 5. 1. Psalm: 51. 10. Numb: 16. 30. Gen: 1. 21. 27. Ezek: 21. 30. 35. Exod: 34. 10. Isai: 48. 7. Psal: 148. 5.—102. 18. Ezek: 28. 13. Gen: 5. 2.—2. 4. Psal: 104. 30. Numb. 16. 30.

1 Sam: 2. 29. Judg: 3. 17. Psal: 73. 4. 1 Kings 4. 23: Dan: 1. 15, Hab: 1. 16. Ezek: 34. 20—34. 3. Gen: 41. 5. 18—41. 2. 7. 20—41. 4.

By a strict examination of the passages in the Old Testament here referred to, the biblical critic will find, that in Gen: 1. 1. *only*, is the word *Bura* translated, *to create or produce from nothing*. In every other place it indicates some *modification* of substance *already existing*.

Hence the belief, honestly entertained and boldly asserted, by some of the most enlightened and pious divines, that the translation “*created*,” affixed to the term *Bura*, in the chapter and verse of Genesis already designated, is calculated and intended rather to accord with the particular hypothesis of the translators, than to render, with accuracy, the meaning of the original.

Note (p) page 46.

It is not contended, that, from the premises here laid down, every individual of the human family, however

ignorant, is able to infer the being, attributes, and government of a God. Such inference is the work of an intellect *somewhat cultiva'ed*. But the requisite degree of cultivation may be derived from the *study of nature*, no less certainly than from the study of the Holy Scriptures.

As an objection to the doctrine we are endeavouring to establish, we are told that the deaf and dumb have no knowledge of a God, until they derive it from their instructors.

The reason of this is obvious. Until they are instructed, they are so ignorant as scarcely to occupy the rank of rational beings.

The first effort of their teachers is to communicate to them the knowledge of God. Instead of this, let these unfortunate beings be taught first to observe nature, and to reason on it, and, without any direct information on the subject, they will soon infer the existence of a *primary constructing and governing cause*, which is tantamount to a belief in the existence and superintendence of a God.

As the author thinks it not improbable, that dishonest attempts, formerly made, will be renewed, to cover with odium, in the minds of the uninformed and the prejudiced, his sentiments on the subject of the religion of *natural revelation*, especially his belief in its equality, in *some respects*, with the religion of *written revelation*, and its superiority to it in *others*, he deems it expedient to fortify his views, on that topic, with the sentiments, corresponding precisely with his own, of some of the most *pious, enlightened* and *orthodox divines*, that have ever done honour to the christian church.

He will begin with Calvin, who, by the strength of his talents, the severity of his morals, the purity of his virtues, and the fervour and intensity of his piety and devotion, gave rise to an epoch in practical theology.

Out of very extensive quotations to the same effect, which might be easily made from the writings of that distinguished reformer, the few following sentences are selected as sufficient for the author's purpose.

"The knowledge of God, is naturally implanted in the minds of men."

"We hold it out of controversy, that there is in the mind of man, even by natural instinct, a certain feeling of the *Godhead*. For, to the end that no man should flee to the pretence of ignorance, *God himself hath planted in all men, a certain understanding of his divine MAJESTY*; that they *all, not one excepted*, may know that there is a *God*.

"Therefore God hath not only planted in the minds of men that seed of religion, which we have spoken of, but also hath so disclosed himself IN THE WHOLE WORKMANSHIP OF THE WORLD, that men cannot open their eyes but they must needs behold him." Again. "He hath, in all his works, graven certain marks of his glory, and those so plain and notably discernable, that the excuse of ignorance is taken away from men, be they never so gross and dull witted."

To the same effect are the sentiments of Bishop Butler, whose analogy between Natural and Revealed religion has been long made a text-book, in most of the colleges of the United States. That distinguished theologian in one place pronounces christianity "a REPUBLICATION and external institution of natural and essential religion," and, in another, declares natural religion to be "the FOUNDATION and PRINCIPAL PART" of christianity. Again. "Christianity teaches natural religion in its genuine simplicity.

"Reason can and ought to judge, not only of the meaning, but also of the morality and the evidence of revelation.

"Let reason be kept to," and if any part of the Scripture account of the redemption of the world by Christ, can be shown to be really contrary to it, let the Scripture, in the name of God, be given up."

The writings of Archbishop Tillotson, one of the ablest and most pious divines that England has produced, abound with matter in favor of the truth and importance of *natural religion*. In a sermon on that subject, one of the most profound and excellent he ever delivered, he declares that God makes known to us our duty, by “A kind of *natural instinct*—By *natural reason*—and, by *the general vote and consent of mankind*.”

In his celebrated work on the Apostolic Epistles, Dr. Macknight, a divine of great learning and piety, and perfectly orthodox in his belief, has the following passage. “Thus, in the compass of two verses, the apostle has explained what the *light of nature* is, and demonstrated that *there is such a light existing*. It is a *revelation* from God, written on the heart or mind of man; consequently is a *revelation common to all nations*, and, so far as it goes, agrees with the things written in the external revelation which God hath made to some nations; *for the mind of men, as made by God, harmonizes with the mind of God*.”

The pious and enlightened Doddridge thus expresses himself:

“Those rules of action, which a man may discover, by the use of his reason, to be agreeable to the *nature of things*, and on which his happiness will appear to him to depend, may be called the *law of nature*; and when these are considered as intimations of the divine will and purpose, they may be called the *natural laws of God*.”

Again. “It is highly for the interest of states, that the great principles of **NATURAL RELIGION** should be believed, viz: *the being and providence of God, and the certainty of an exact retribution either here or hereafter*”—“For any one to pour contempt upon this natural law of God, under pretence of extolling any supposed divine revelation, or intimation of God’s will in an extraordinary manner, will appear very *absurd*”—“No discovery (meaning *revelation*) can be supposed so

particular, as not to need the use of *reasoning upon the principles of the law of nature*, in explaining and applying it to particular cases."

Bishop Stillingfleet—"I shall, therefore, attempt to prove, that the christian religion not only supposes, but improves, refines, establishes, and enforces, the general and most allowed principles of *natural religion*, as to the being of God and providence, *the most agreeable way of worship*, the nature and kind of moral duties, and the *rewards and punishments of another world.*"

Dr. Barrow, a divine distinguished alike for eloquence and piety.

"The first excellency, peculiar to the christian doctrine, is, that it gives us a true, proper, and complete character & notion of God, such as perfectly agrees with what the *best reason dictates*, THE WORKS OF NATURE DECLARE, ancient tradition doth attest, and common experience testify."

Vattel, although not a divine, is a writer of great soundness and acknowledged authority. In his works we find the following sentence.

"Every religion that should, in this case, *clash with the law of nature*, would bear upon it the *marks of reprobation*, and it could not come from the *AUTHOR of nature*, who is always constant, always faithful."

A well known citizen of the state of Kentucky, distinguished alike as a civilian, a jurist, and an advocate, when lately pleading in a very important trial, expressed himself to the jury, in the following words. "The *character of God* may be as truly read in the *works of Nature*, as in the *Scripture*. They are equally inviolable, and point out *their divine author.*"—(See trial of I. B. Desha, p. 190.)

Were the author inclined to pursue this subject, he might, for further testimony to the truth and excellency of the religion of NATURAL REVELATION, refer to the works of Derham, Paley, Harvey, Young, Sturm, and several other writers of equal distinction. But his

memoir is already protracted greatly beyond the limits he had originally assigned to it. He will only add, that, in preparing this note, his intention has been, not to make himself responsible for the correctness of the sentiments of the several authors he has quoted and named, (although he deems them correct,) but merely to show, that many individuals, of the highest reputation, for talents, piety, and christian orthodoxy, have been firm believers and decided advocates of the truth and practical value of **NATURAL RELIGION.**

MEMOIR II.

PREFATORY NOTE.

THAT the author might render to each of the questions, that constitute the basis of this Dissertation, an answer as precise and specific as possible, he has replied to them severally in the order in which they are propounded in the series.

Although they all differ from each other in their *principal* and *immediate objects*, most of them embrace some points that are common to the rest. This circumstance has necessarily led, in the replies, to occasional repetitions of facts and opinions that had been previously stated.

In whatever degree such repetitions may detract from the symmetry and merits of his Dissertation, as a literary performance, they will not the author trusts, in any measure impair its practical utility, nor detract from its aptness as an answer to the queries.

He will regret exceedingly to be found deficient, in any instance, in the details that may be deemed requisite for the satisfactory illustration of the topic under consideration. Should such an event occur, he hopes it will be attributed to its true cause, a solicitude to avoid prolixity in discussion, and not to the want of illustrative materials.

The only difficulty he has experienced, in preparing his Dissertation, has been, not in procuring facts, but in selecting the most suitable from the abundance that presented itself. The mechanical exercise of the pen excepted, a volume could have been written with more facility than this production.

TRANSYLVANIA UNIVERSITY,
Lexington, Ky., Oct. 23d, 1823. {

ADVERTISEMENT.

THAT the reader may understand the cause of the peculiar shape in which this memoir appears, he is informed, that, according to a scheme concerted and made public, the best Dissertation that might be written in answer to the questions to which it relates, and which were proposed by His Grace, the Duke of Holstein Oldenburg, with the view of informing himself how best to protect his realm from supposed contagion, was to be entitled to a prize of a specified value. An invitation to contend for this prize was liberally given to medical philosophers of every country. On the merits of the Dissertations that might be received, pursuant to this arrangement, the College of Physicians of Berlin was appointed to decide.

Although, when the author prepared this memoir, it was his purpose to submit it to the tribunal designated, as a prize-dissertation, he relinquished his intention, on a twofold ground. He was deterred, in part, by the difficulty of transmitting the manuscript to its place of destination; but, more particularly, by what he believed to be the dis-qualifications of those who were authorised to sit in judgment on it.

The College of Physicians of Berlin, although an able, enlightened, and very respectable society, possesses, as a body, no *experimental knowledge* of yellow fever. *Probably* not an individual member of it, has ever witnessed a case of that disease.

Nor is this all. It is, perhaps, equally probable, that, from the prejudices of Education, the influence of books, and the prevailing opinion of the North of Europe, the college consists *entirely of contagionists*. Or if not entirely, at least with the exception of but a very few members. However pure and upright may be its intentions, then—and the author does not permit himself for a moment to doubt them—it cannot be an impartial and a competent tribunal. Its feelings being pre-occupied, its judgment must be in chains.

Hence, to submit the Dissertation to its decision, was not deemed expedient. It was, therefore, withheld from the Faculty of Berlin, and awaits the judgment of an enlightened public.

As originally prepared, the Memoir contained no directions as to the treatment of the disease to which it relates. To render it more useful, because more practical, these were subsequently added.

Lexington, Ky. January 1st, 1826.

A DISSERTATION,

IN ANSWER TO

Certain prize questions, proposed by His Grace, the Duke of Holstein Oldenburg, respecting the "origin, contagion, and general philosophy of yellow fever, and the practicability of that disease prevailing in high northern latitudes," with thoughts on its prevention and treatment.

PRIZE QUESTIONS.

I. What are the causes of Yellow Fever in tropical climates?

I. Quæ sunt causæ febris flavæ in terris tropicis?

II. Is the Yellow Fever of the South of Europe, and that of the United States of America, similar to the Yellow Fever of tropical climates, and does it arise from the same causes?

II. Num febris flava Europæ australis, civitatumque Americæ septentrionalis consociatarum, febri flavæ terrarum tropicarum similis est iisdemque causis oriatur?

III. Is yellow fever a specific disease, or only a higher grade of intermitting and remitting fever, endemical in hot climates?

III. Mœrbus peculiaris, seu, ut vulgo dicunt, speci-

ticus, an nihil nisi vehementior febris biliosa intermitens et remittens, climatibusque fervidioribus endemica est?

IV. Does it prevail as an endemic in the low grounds of the sea-coast only, where it has heretofore appeared, leaving the more elevated places untouched?

IV. Utrum ubicunque hucusque exorta est in oris maritimis inferioribus solummodo endemice grassatur, et locos editiores intactos relinquit?

V. Does Yellow Fever appear more frequently as a sporadic complaint, and only occasionally as an epidemic during the hottest seasons of the year?

V. Num saepius sporadice tantum, et nonnumquam solummodo flagrantissimo anni tempore, ut epidemia appetat.

VI. In the most violent and malignant form of Yellow Fever, is any thing secreted and thrown out from the body, which can communicate the disease, either directly or indirectly, from the sick to the well?

VI. Num in ea fortasse, vehementissima facta, quodam secerni segregarique potest, quod contagione, vel proxima vel remota, aliis corporibus communicatur?

VII. What degree of temperature is necessary to produce the disease and render it epidemic, and to what degree of north latitude has it heretofore extended?

VII. Quantus caloris gradus requiritur, ut epidemiæ naturam induat, sicque divulgetur, et ad quem gradum latitudinis septentrionalis hucusque pervenit.

VIII. May not the disease arise and prevail as an epidemic on the seacoast of Northern Europe, especially on the northwestern borders of Germany, during the

hottest months of summer, or is it peculiar to warm and tropical climates.

VIII. Nonne etiam hæc febris mensibus æstivis fervidioribus, in oris Europæ aquilonaris, et præsertim Germaniæ ad cœurum sitæ maritimis oriri et epidemice divulgari poterit, an potius morbus tropicis et omnibus terris calidioribus proprius est?

IX. Should question VI. respecting the contagious nature of Yellow Fever, be answered in the affirmative, must we not conclude, that the disease, although not capable of arising and spreading as an endemic or epidemic, on the seacoasts of the north, on account of the low summer temperature of those regions, may yet be introduced and propagated there, in a contagious and sporadic form, by vessels arriving from its native climate, having on board infected merchandise, individuals, or cloathing?

IX. Quod si quæstio VI. de contagiosa hujus febris indeole affirmetur, nonne statuendum est etiamsi in regionibus septentrionalibus et prope oram maritimam jacentibus propter minorem caloris gradum, oriri febris ista endemice, vulgarique epidemice non possit; fervidioribus tamen mensibus periculum contagionis imminere his regionibus et quidem navibus e patria hujus morbi venientibus, sive mercibus venenum recipientibus onustæ sint, sive socii infecti et lue jam correpti, eisque, si non propagationem epidemicam, sporadicam tamen, ut dicunt, contagionem effici posse?

X. Although incapable of generating the same complaint, can the contagion of Yellow Fever, in northern latitudes give rise to any other destructive disease?

X. Num febris flavæ contagium, etiamsi in terris sep-

tentriōnem versus sitis, hujus ipsius morbi naturam induere non possit, alios morbos exitiosos gignere potest?

XI. Should the answer to question **IX**, being affirmative, admit that Yellow Fever may be translated to the climates of the north, and there prevail, if not epidemically, at least in a sporadic form,

a. What means should be adopted to prevent its introduction, especially if the contagion can be conveyed in merchandise brought from infected ports?

b. Should the answer be negative, ought the institution of quarantine to be abolished?

XI. Quæstione IX. affirmatur, febrim flavam utique in loca frigidiora transferri, et ibi, se non epidemice grassari, attamen sporadicam contagionem efficere posse, quæretur,

a. Quæ consilia ad eam repellendam incunda sint, præsertim si contagio per merces e portis infectis allatas esse potest, et,

b. Num, si hoc negetur, institutum moræ quadrangulariæ sit rejiciendum?

INTRODUCTORY REMARKS.

That he may give to the Medical Faculty of the University of Berlin, the *least* possible trouble in reading this dissertation, and every practicable facility in judging of its merits, it is the intention of the author to compress it within as narrow limits, as a due regard to perspicuity of expression, and the requisite explanatory details, will admit. To communicate truth, and to be clearly understood, are the points that claim his attention, and awaken his solicitude.

Having derived his knowledge of yellow fever, much more from observation and experience, than from books, he will affect in the following pages no parade of medical learning. Content with a brief recital of facts, and such inferences from them as he may deem most important, for the views he may present, and the principles he means to advocate, his reliance will be, in a great measure, on his own resources. Although he will often refer, for authority and illustration, to events that are well known, and many of which have been long on record, yet, of most of them, he was himself a witness, and in not a few of them an interested actor.

In the year 1793, so memorable in the American annals of medicine, during the summer and autumn of which, yellow fever swept so destructively through the city of Philadelphia, he commenced his professional studies, in the university of that place, and saw, as a pupil, no inconsiderable portion of the disease.

From that time, until the year 1805 inclusively, eve-

ry summer was more or less pestilential. Six times within that period, viz: in 1797, 1798, 1799, 1802, 1803, and 1805, did yellow fever prevail *epidemically* in the city of Philadelphia. During this protracted series of calamities, he was a resident of that metropolis, and a spectator of events.

In the spring of 1797, he entered on the practical duties of his profession, and was extensively conversant with the disease, and he hopes he may add, without either presumption or vanity, faithfully observant of it, on each occasion when it subsequently prevailed. During the prevalence of the fever in 1803, he was a member of the Board of Health, and one of the physicians of the city Hospital. A better opportunity to acquire an intimate knowledge of the complaint, in its entire character, and in all its relations, he could not have enjoyed. In his own person he experienced three attacks of it, the *first* exceedingly malignant and dangerous, but the *two latter* less severe than a common intermittent.

The earliest impressions which he received from his preceptors, and from books which were placed in his hands for the purpose, respecting yellow fever, were, that it was highly contagious. Confident, perhaps, to excess, in this persuasion, he zealously commenced his observations on it in person. But experience soon convinced him of his error.

Even before it had closed its epidemic career in 1793, he perceived, with surprise, that in an uncontaminated atmosphere, it was not communicable from the sick to the well. From that moment his ardour as a contagionist began to subside, and even to yield to doubts as

to the truth of the Doctrine he had imbibed. Nor was it long, until by subsequent observation, these doubts terminated in a conviction that his views had been erroneous. The principal facts which led to that conviction, will be faithfully recited in this Dissertation.

Thus far has the author deemed it expedient to speak of himself; not, as he trusts, from motives of egotism, but to show, by an honest representation of events, that his opportunities to acquire some knowledge of yellow fever have not been inconsiderable.

As further introductory, he will only add, that, although very young at the time, he was one of the earliest defenders of the *non-contagion* of this disease in the United States, and that his writings, some of which he shall have occasion to quote in the following pages, were believed, at the time, to have contributed their share to the change of public sentiment which gradually ensued.

A belief very generally prevails, even among those who ought to be better informed on the subject, that the doctrine of the *non-contagion* of yellow fever, at least in the United States, is ascribable to the genius of the late Dr. Rush. To prove the fallacy of this belief, testimony ample and conclusive can be adduced.

That that distinguished physician was the founder of the doctrine of the *domestic origin* of yellow fever, in the United States, cannot be denied. But when the disease appeared in Philadelphia, in 1793, his writings evince that he was a confirmed *contagionist*. He believed that the complaint originated from the putrefaction of animal and vegetable substances; but that, when thus generated, it was communicable, *by contagion*, from

the sick to the well. Nor was it until about the year 1805-6 or 7, (the precise date is not recollectcd,) that he abandoned this opinion, and published, in the **New York Medical Repository**, his recantation of it. All this appears on record, under the sanction of his own name.

REPLIES TO THE QUESTIONS PROPOSED.

I. *What are the causes of Yellow Fever in tropical climates?*

To this question the correct reply, expressed succinctly and without detail, would be, that in tropical climates, yellow fever is produced by a *malaria* or poisonous exhalation, arising from the decomposition and recombination of the matter of organic substances.

But, to render the answer as clear and satisfactory as the subject merits and the occasion requires, a brief exposition of it; by way of illustration, appears to be requisite.

In furnishing this, it is important to observe, that several causes act as auxiliaries to that on which the disease essentially depends.

For the production of the febrile poison, a temperature of the atmosphere *high* and long continued, is found to be requisite. Nor is it without reason that that temperature is believed to be influential in rendering the system more susceptible than it would be under a *lower* one, of the action of the exhalation it has been instrumental in generating. Under any temperature, this poison, if introduced into the stomach, the organ on which it seems primarily to act, would doubtless produce fever, but its action can scarcely fail to be greatly facilitated by that state of debility and enfeebled resistance, into which the system is necessarily thrown, by the influence of long continued tropical heats. Those heats act primarily and immediately on the skin, and

sympathetically on the abdominal viscera, thus exhausting and debilitating the organs both externally and internally.

In the production of the disease, the operation of malaria and heat, is powerfully aided by frequent and sudden vicissitudes in the sensible qualities of the atmosphere, especially those from dryness to humidity, and from a higher to a lower temperature—such, for example, as usually occur in the passage of time from day to night. Changes in the *weight* of the atmosphere are not known to have any appreciable effect in relation to the disease. If they have, it is *secondarily*, through the medium of other atmospheric mutations which they produce.

These causes united are sufficient of themselves to produce yellow fever *sporadically*, and perhaps as an *epidemic*. But to render it *epidemic*, a *pestilential constitution* of the atmosphere must concur.

It is contended by some, that a very high and long continued temperature of the weather, accompanied by frequent vicissitudes in the sensible qualities of the air, is alone sufficient for the production of the disease.

The fallacy of this opinion appears from the well known fact, that where none but those two causes exist, the complaint never prevails. By arguments to be adduced hereafter, this point will be more fully illustrated.

By the following considerations, does this reply to the question proposed, appear to be supported, in the several elements of which it is composed.

In three respects chiefly do tropical differ materially from other climates, viz. temperature, the average of rain

that falls, and the luxuriancy and general amount of vegetation. To these may be added, as a matter of minor consideration, the superabundance of insects and reptiles, which increases as you advance towards the heats of the equator; and, as a consequence of the whole, the greater extent, activity, and constancy of the putrefactive process. (a)

To the influence of some of these causes, then, or to the combined operation of two or more of them, must we attribute the indigenous growth of yellow fever. But that neither of them *singly* can generate that disease, may be demonstrated by a brief analysis of the subject.

The mean temperature of tropical climates is from 80 to 83deg. of Fahrenheit's thermometer.

That this cause is not alone competent to the production of yellow fever, appears from facts of general notoriety.

In tropical seas, the crews of vessels that are cleanly in themselves, and free from damaged cargoes, are never attacked by it. The same is true of vessels of this description lying in harbour, *beyond the reach of exhalations from the shore*. Even the inhabitants of tropical plains, hills, and other situations, themselves dry, and remote from bodies of stagnant water, are exempt from this disease. From many parts of Africa and South America, conclusive evidence of this is derived. But were the fever the product of temperature alone, this would not be the case, the places just designated being subject to as intense heats as those are where it prevails. Nor, in extra-tropical regions, does the complaint ever occur during the most intemperate

summers, unless in places where the temperature is aided by other causes.

In no climate have *rains alone* been ever suspected as the source of malignant fever. Nor do they possess qualities calculated to render them so. Were they thus deleterious between the tropics, then would the disease we are considering prevail wherever they fall in sufficient abundance. But they fall at sea, in harbours at a distance from shore, and on hills and plains remote from marshes and stagnant waters, as copiously as elsewhere. Hence, the fact, that those places are exempt from fever, is evidence satisfactory that *rains* do not produce it.

That neither the mere luxuriance of vegetation, a superabundance of insects and reptiles, nor sudden vicissitudes of atmospherical temperature, are alone the source of this disease, may be proved by a similar course of reasoning. Each of these, singly, exists in as high a degree, in places free from fever, as in those where it prevails.

But, respecting the *combined influence* of some of these causes, a different opinion commands our belief. To prove that, in tropical climates, *that influence* is the genuine source of yellow fever, evidence which we hold to be sufficient may be adduced.

As an *endemic*, the disease prevails chiefly, if not only, during the hottest months of the year. And, other things being alike, the more intense and protracted the heats, the more certainly does it appear, the more malignant is its character, the more extensive its prevalence, and the more destructive its ravages.

But, to give it existence, *stagnant water* and *dead*

vegetable, mingled perhaps with animal matter, must unite their agency to that of *high and long continued heats*. In whatever inhabited part of the torrid zone these three causes co-operate sufficiently to excite in the organic matter concerned, a vigorous and protracted putrefactive process, and to evolve an abundance of pestiferous exhalation, there, yellow fever is inevitably generated. And where they do not thus co-operate, it never occurs.

That this is true, the medical history of the West India Islands, of many continental parts of tropical America, and of sundry trading establishments in Africa conclusively testify. Hence the disease appears only in large populous cities, where, from *artificial causes*, moisture and putrifiable matter are *necessarily* accumulated, in flat maritime situations, and in the low grounds of water courses, where *nature herself* makes similar depositions, or within the range of exhalations from marshes, or other depositaries of stagnant water and organic filth. And in situations of this description, placed beneath the influence of a tropical sun, especially during the hottest season of the year, *the effluvia productive of yellow fever are never wanting*. In proof of this, strangers from temperate and high latitudes, visiting such places, are constantly liable to be attacked by it, either *sporadically*, or in the character of an *endemic*. To render it *epidemic*, a malignant or pestilential constitution of the atmosphere must, as already stated, concur with the other causes that have been specified.

Strictly speaking, then, in the production of *epidemic* yellow fever, four agents must co-operate, viz. a high

temperature of considerable duration, stagnant moisture, dead organic matter, and a deleterious constitution of the atmosphere.

To produce the *effect*, the latter agent is as essential as either of the former.

To attempt to account for this fact, is not my present intention. Nor, to any of the purposes I have in view, is it essential that I should. To establish it, as the result of observation, is sufficient.

Were I, however, to hazard an opinion on the subject, I might allege, that the deleterious constitution of the atmosphere acts in one or both of the following modes.

It aids in the production of the *pre-disposition* to yellow fever, or, by its influence, prevents the poisonous gas, which chiefly engenders that pre-disposition, from being so readily diluted, dissipated, or neutralized, by the atmosphere, as it would be, if the constitution did not prevail. In either way, *singly*, it may contribute to the spread of the disease. By acting in both ways, it will be *doubly* powerful.

To cite, in confirmation of these several positions, instances which must be familiar to every one versed in medical literature, would be superfluous. They are to be found in the works of most authors of reputation, who have written, from observation, historically or philosophically, on the bilious endemic of tropical climates. Nor can any one fail to have a lively recollection of them, who has enjoyed opportunities of personal observation.

I know it is contended by a few medical writers, one or two of them of no ordinary standing, that yellow

fever is not an endemic of the West India Islands, nor of the tropical section of the American continent, but was imported into them from distant regions, and propagated by means of a specific contagion.

By father Labat, a Dominican friar, we are assured, that, about the year 1686, this disease was introduced into Martinique, from Siam in India, by the *Oriflamme* ship of war, and spread rapidly *by contagion*, producing among strangers the most frightful mortality. Hence it received the denomination of "*Mal de Siam*," and must, according to this view of the subject, have maintained itself in the West Indies ever since, by its specific capacity of self-propagation.

It is unfortunate for the ecclesiastic who has transmitted this report to us, that, in support of his opinion, he adduces no evidence superior in weight to his own assertion. *Yet he was not in Martinique when the Oriflamme arrived*, nor did he visit that island until eight years afterwards. These facts being recorded by himself, need no further proof.

To attempt a refutation, or even an analysis of such a statement, would be a humiliating condescension and a waste of time. A more imbecile story has rarely been propagated. Yet has it been made the foundation of an obstinate controversy, respecting the origin of yellow fever. It is here referred to, only to show, on what feeble and frivolous evidence medical writers too often rely, when treating of subjects of vital importance. Nor does this observation apply to any topic with more pertinency or force, than to the usual mode of discussing the point of doctrine we are now considering.

It is sufficient to add, that, as far as *authentic facts*

enable us to judge, the fever described by father Labat did not spread by contagion. The correct history of its appearance, progress, and termination, refutes such a belief. (b) Nor, from our knowledge of Siam, are we authorised to believe, that that seaport has ever been infested by such a disease. The place is sickly; but, as far as I am informed, no author has pronounced it subject to yellow fever. Indeed the whole narrative deserves to be regarded as one of the numerous fictions in medicine, by which we have so credulously suffered ourselves to be deluded, in relation to the subject of febrile contagion.

By Dr. Chisholm, Inspector General of the British ordnance medical department in the West Indies, an elaborate work, in two volumes octavo, was written to prove, that, in February 1793, yellow fever was imported from Bulama in Africa, in the ship Hankey, propagated by contagion in the town of St. George in Grenada, and thence communicated, not only to many other West India Islands, but to the United States, South America, Ireland, and various seaports in the South of Spain.

An effort more visionary and unsuccessful than this, has rarely been made by a respectable inquirer. The pursuit after the philosopher's stone might be cited as a counterpart to it, both in principle and issue.

For talent and knowledge, Dr. Chisholm maintains a reputable standing among his contemporaries; and, as a controversial writer, few men have ever possessed a superior amount of zeal and perseverance. His experience, moreover, is sufficiently ample. Yet, with all his resources, he has utterly failed in his attempt to prove

that yellow fever is contagious. Even from his own statements, as far as he has given us a specification of facts, the contrary opinion is necessarily deducible. Were it admissible, on the present occasion, to introduce an analytical view of his work, this assertion could be fully substantiated by it. To the production itself, then, I might safely refer for its own refutation.

In relation to the contagious nature of this complaint, and its importation from foreign places, all writers of *high authority*, on West India diseases, who have adverted to the subject, are opposed to Dr Chisholm in sentiment. Of these, it is sufficient to particularize Mosely, McClean, Lempriere, Pinkard, Boreland, Jackson, and Bancroft. The latter, more especially, has, with great minuteness and accuracy, examined in detail, and successfully overthrown, the hypothesis which Dr. Chisholm had so laboriously erected.

At a much earlier period, when too youthful, perhaps, both in medicine and years, to encounter, without temerity, an antagonist so disciplined and full of resources, I myself attempted an analysis and refutation of the opinions of that writer on the same subject. Of the manner of this attempt, and the success that attended it, some judgment may be formed, from a perusal of No. IX, of the second memoir of my work published in 1801, entitled "Medical and Physical Memoirs."

Although Dr. Bancroft's publication, which appeared long afterwards, is by far more voluminous, I am not confident, that it contains, *in detail*, any thing that mine does not exhibit, *in principle*. In some respects, it might serve as a commentary on mine. It is to be distinctly understood, that nothing here stated is intended

as a charge of plagiarism against Dr. Bancroft. Although he quotes some of my writings of that period, I am prepared to believe, that my "Medical and Physical Memoirs," had never been read by him. Had they been, there exists no sufficient reason why he should not have also referred to them; especially as his reference to my other writings is respectful and even flattering.

The other numbers of the same memoir, contain my early views, which have not since been materially altered, in opposition to the hypothesis of the importation of yellow fever into the city of Philadelphia. Those views, when originally published, were disbelieved by ninety-nine hundredths of the American community; but, sanctioned and recommended by time and experience, they are now almost universally adopted.

When rigidly examined, nothing can surprise us more by its fallacy and extravagance, than Dr. Chisholm's opinion respecting the *importation* of yellow fever into the West Indies, in 1793, and its *communication thence, in a few months*, to the numerous and distant places to which, in his enthusiasm, he professes to trace it.

Under the former head he asserts, that the disease was introduced into Grenada, by the ship Hankey, on the 19th of February, 1793.

In opposition to this, it is sufficient to state, that that vessel was perfectly *healthy* when she reached Grenada, that she had been twice cleansed before her arrival, and had previously touched at two other islands, and held a free intercourse with the inhabitants on shore, as well as with the crews of the Charon and Scorpion, British ships of war, without infecting them.

Why she should, in a very few days after leaving *St. Vincents*, the last place at which she had touched, become such a formidable nidus of contagion, or why the people of *Grenada* should have been more susceptible of this contagion, admitting its antecedent existence, than those of the other islands, it belongs to Dr. Chisholm or his advocates to inform us. And until, on these topics, they shall have favoured us with satisfactory information, their cause will continue as desperate as at present.

But the point on which our author is most unreasonably extravagant and erroneous, is the unprecedented rapidity, under the most unfavorable circumstances, of the supposed communication of the disease, by means of contagion, from *Grenada* to other places.

It is universally admitted, that tropical climates, where houses are kept open, and ventilation is free, are much less favorable to the propagation of contagious diseases, than climates where houses are closed, and ventilation confined. For the same reason, the summer season is less favorable than the winter. Keeping these facts in view, let us briefly examine the alleged propagation of the *Grenada* fever.

As already stated, that disease appeared in the town of *St. George*, on the 19th of February, 1793. According to the history of it, by Dr. Chisholm, it made its appearance in the month of April, of the same year, in the island of *St. Vincents*, to which the Hankey herself, (having, as already remarked, touched at that place, previously to her arrival at *Grenada*,) had been unable to communicate it, notwithstanding the reputed amount and concentration of her contagion.

In May, it made its entrance into Barbadoes and Demarara, at the *former of which the Hankey had also previously touched, without being able herself to infect it.*

In June, it commenced its ravages in Dominica, Antigua, and St. Christophers. On the 13th of the month it *appeared* in the first of those islands, and was *generally diffused* by the 20th! For a disease, under the heats of a tropical sun, to overrun a community, by means of contagion, a *secreted poison*, in *seven days*, is an unheard of event! A progress rapid beyond example, or even suspicion!

Let those who can *conceive* of such an occurrence, give *credence* to it. *I can do neither.*

In July, the complaint attacked the inhabitants of Tobago.

In August, those of St. Croix.

In October, the inhabitants of Martinico, and those of St. Thomas, in the month of November. In each place its spread was nearly as rapid as in the Island of Dominica.

In the mean time, it had been conveyed to Philadelphia, in the month of July, and, about the same period, to several ports on the Spanish main. Nor was it long in finding its way to Ireland, Gibraltar, and other places in the south of Europe, and in pushing its devastations throughout the whole of the West Indies.

Such is the representation, given by Dr. Chisholm, of the propagation of yellow fever, *by means of contagion.* A single ship, twice cleansed and ventilated, diffused her febrile poison, in a few months, over an extensive section of the globe! The plant of contagion, rooted by accident in the little island of Grenada, shot

forth its gigantic branches with the fleetness of the wind, and scattered its pestiferous fruits, over all the West Indies, a large portion of the American continent, and not a small one of the continent of Europe! Thus monstrous and incongruous is the picture presented to us! But to drop the metaphor.

In the rapid propagation of this disease, and the extent of space through which it is reported to have spread, in so short a period, and from so limited a source, throwing itself almost simultaneously on many points so widely distant from each other, there is something *preternatural*. The usual and necessary proportion between cause and effect is entirely wanting in it. The idea inculcated participates so much of the wildness and extravagance of romance, that between it and sober belief there is no affinity. The youthful and credulous *may* receive it; but the matured and the experienced *are compelled* to reject it. It might have suited the gloom of the sixteenth century, but by the lights of the nineteenth its enormities are detected. Had the complaint been small pox, and a hundred agents employed to spread it, it could not have been propagated with such rapidity.

An effect so general and extensive, must have been produced by a general cause of equal extent. So many concurring phenomena must have had their origin in a common source. And that cause was nothing else than a pestilential state of the atmosphere extensively prevailing, assisted, in many places, by local circumstances. A cause more limited in its scope is disproportioned to the mighty effect. To those who have studied attentively the history and laws of epidemical com-

plaints, the influence of such a constitution of the atmosphere will abundantly explain *the malignant character and unusual mortality* of the prevailing distemper, which induced Dr. Chisholm to pronounce it a *new disease*.

As well might you attribute the thunder of the skies, to the discharge of a Leyden phial, or the destructive hurricane to the waving of a lady's fan, as so rapid and extensive a propagation of disease, to the slow and limited action of contagion. Small pox, by far the most contagious of diseases, could not, by its mere inherent power of *self-propagation*, overrun the same section of the globe in seven years—scarcely, perhaps, in twenty.

If called on, in a general way, for proof of the existence of a morbid constitution of the atmosphere on an extended scale, I find it in that state of things which gives rise to Influenza. That disease is not contagious. Yet has it several times, within my recollection, pervaded, in a few months, the whole of the United States and of the West India Islands, and many parts of South America. Without any peculiarity in the sensible qualities of the atmosphere to produce the effect, the same complaint has also, on sundry occasions, overrun, in a few months, a great part of Europe.

Another memorable example of a morbid constitution is discoverable in that condition of the atmosphere, which, in 1811, 1812, and 1813, disseminated irregularly over the whole United States, the disease denominated *peripneumonia typhoides*. Neither in the character of the weather of that period, in the state of the country, nor in the mode of life of the inhabitants, was there anything different from what exists at present. Nor

was the disease, of which I am speaking, propagated by contagion. Its *prevailing for a time*, therefore, and then *disappearing without any perceptible cause sufficient to account for either event*, can be attributed only to the *prevalence and disappearance* of a peculiarly deleterious constitution of the atmosphere.

Indeed such constitution must be presumed to exist in every instance, where, without any *discoverable cause*, disease pervades, to an inordinate extent, a whole community.

An attempt to derive effects like these from an agent so circumscribed and feeble as that of a poison secreted by the human body, is perfectly inadmissible.

But the foregoing are not the only grounds on which we are authorized to deny the introduction of yellow fever from a foreign country into the port of St. George, in 1793.

To physicians acquainted with the medical history of the West Indies, the fact is familiar, that, ever since the first discovery of those Islands, yellow fever has been the scourge of adventurers to them from temperate climates. Even the followers of Columbus were attacked by it, and not a few of them destroyed by its malignity. During the long and sanguinary wars, of the eighteenth century, between England and France, for the sovereignty of North America, several campaigns were entirely frustrated, by the ravages of that disease, in the fleets and armies of the contending powers. Nor did any one, in those early times, dream of it as ought but a native of the places where it so frequently prevailed.

In 1647 it raged with violence in the Island of Bar-

badoes, and, at a subsequent period, but long before the time of Dr. Chisholm, swept off, in about eighteen months, one third of the inhabitants of St. Christopher's. In several other instances, during the seventeenth and eighteenth centuries, which, for the sake of brevity, I forbear to specify, did it prevail with a mortality no less deplorable.

In fact, ever since the West Indies became a theatre of European war, that disease has, in those regions, proved much more destructive to fleets and armies, than fire-arms and the sword. That this is no exaggerated assertion, might be easily proved, did the occasion admit of the requisite details.

In refutation of the hypothesis of Dr. Chisholm, that the yellow fever of the United States was the offspring of that of Bulama in Africa, and that it was first introduced into Philadelphia, from the West India Islands, in 1793, it is sufficient to state, that, in the autumn of 1792, the disease made its appearance in New York, and proved fatal to a considerable number of the inhabitants. Although but little notice has been taken of that occurrence, the mortality produced by it not having been very extensive, it is not the less true that it actually took place.

Whatever might have been the origin, then, of the American yellow fever, it had no connection with the pestilence of Grenada, which did not appear in that Island, until *six months after* the commencement of the fever of New York. Nor, notwithstanding their industry and exertions to that effect, were the advocates of importation able to establish any actual coincidence, as to either time or place, between the arrival of sickly

vessels from the West Indies, and the appearance of the fever in the city of Philadelphia. But it were useless to dwell longer in refutation of an opinion, which is abandoned by every ingenuous inquirer, and which even the author himself would scarcely, at present, have the hardihood to defend. To those who may be curious of a more thorough discussion of the subject, I beg leave to recommend the perusal of Bancroft on yellow fever, and my own Memoirs.

From the foregoing disquisition, I trust it appears, on unexceptionable testimony, that the yellow fever of tropical climates is an endemic of those regions, the immediate offspring of deleterious exhalation, arising from that process of decomposition and recombination of organic matter, which there so extensively and constantly prevails.

II. Is the yellow fever of the South of Europe, and that of the United States of America, similar to the yellow fever of tropical climates, and does it arise from the same causes?

To both branches of this question my reply is affirmative.

As respects the yellow fever of the United States, and that of tropical climates, my knowledge is derived from personal observation. Of them, therefore, it will be permitted me to speak with decision. To pronounce them *merely similar*, would be a feeble expression. *In every essential characteristic they are the same.* This is true of their access, their progress, their type, their symptoms, their particular seat, their general pathology, and the places where they prevail; and also in relation

to the descriptions of persons *most* and *least* liable to be attacked by them.

They are both ardent continued fevers, having but one chill, with morning remissions scarcely perceptible, and terminate usually from the third to the seventh day.

About the third day, in both, in cases of a high and perilous grade, a suspension of febrile and other distressing symptoms takes place, and continues a few hours, to the joy of the inexperienced physician and attendant, but to the dismay of those who are familiar with the disease. This flattering but delusive interval is the usual harbinger of a scene of gastric derangement, which, after infinite distress, terminates, for the most part, in black vomit and death.

Of cases highly malignant, the characteristic symptoms in both are, a yellow skin, (whence the name of the disease,) a muddy or reddish and watery eye, obstinate vomiting, a soreness of the epigastric region to the touch, united with a sensation of burning in the part, black vomit as already stated, and hemorrhages from the stomach, gums, and other parts of the body. In each, the biliary secretion is sometimes defective and at other times redundant, as is the case in all fevers of a gastric character.

The immediate seat of both is gastric or hepatic—certainly in some of the chylopoietic viscera—and their general pathology, inflammatory or congestive.

Post-mortem dissections exhibit, in both, similar derangements of the same abdominal viscera. In each of them the brain is also discovered, at times, to be affected

alike by inflammation or congestion. But in neither of them is this a predominant symptom.

The place of prevalence of both is the low, humid or marshy ground of some considerable body of water, or a place assimilated to it by artificial causes.

They both attack the natives of temperate and cold climates, but suffer the native and acclimated inhabitants of the tropics to escape. Creoles, and negroes from Africa are peculiarly exempt from them.

They are again similar in their capability of attacking the same individual sundry times, but less violently and dangerously on each succeeding attack.

Finally, they are similar, as will more fully appear hereafter, in their freedom from contagion.

Having never witnessed a recent case of yellow fever from the South of Europe, I must rely, for my knowledge of that disease, on the testimony of others. But, fortunately for the cause of truth and science, there exists, on the subject, evidence that is conclusive. Authors of competency and character have written on it, and whatever we may think of their *opinions*, we are forbidden to question their *statements of facts*.

From these we learn, that, historically considered, the yellow fever of Cadiz, Seville, Salamanca, and other parts of Spain, and that of the United States of America, are, in every essential characteristic, the same.

Like that of the United States, the yellow fever of the South of Europe appears only during the summer and autumnal months, in flat and depressed situations, after heavy rains, and heats of unusual intensity and duration. Nor are those diseases less alike, in relation to

the time and manner of their disappearance. On the commencement of cold weather, towards the close of autumn, or the beginning of winter, it is known that they both immediately cease to prevail.

The yellow fever of the South of Europe, like that of the United States, spares the native and acclimated inhabitants of tropical regions, and attacks only the natives of temperate and high latitudes. And the colder the climate, in which the subjects have been born and reared, the more liable are they to the complaint, and the more malignant and dangerous does it usually prove.

Another important point of similarity between these two diseases, is, that neither of them can spread in the salubrious atmosphere of elevated and dry places, and that they are, therefore, equally free from contagion.

They are further alike in banishing, during their continuance, all other febrile diseases, from the situations where they prevail, or in imprinting on them their own predominant features. Nor is it unworthy of remark, that they are usually *alike fatal* in their attacks on the intemperate, especially on those that are habitual drunkards.

In relation to their characteristic symptoms, these two diseases are specifically the same. That this is true, appears from a comparison of the description of the American disease already given, with the following extract from the work of an accurate medical observer, who had been extensively conversant with the yellow fever of Spain. In describing that disease, he represents the symptoms, in malignant cases, to have been,

“La hemorrhagia de narices, la vomicion sanguineolenta por la boca, la melena deyecciones de sangre, la

ictericia, las petechias, y ultimamente el vomito atrabilioso, a que han querido llamar vomito prieto, semejante al quo es endemico en ciertas estaciones del ano, en Vera Cruz, Honduras," &c.

"Hermorrhagy from the nose, sanguineous vomitings, bloody and dark discharges by stool, yellowness of the skin, petechiae, and finally, black vomit, such as, at certain seasons of the year, are endemical at Vera Cruz, Honduras," &c.

That the immediate seat of the yellow fever of Spain, like that of the same disease in the United States of America, is gastric and hepatic, and that congestion and inflammation in the viscera of the abdomen, constitute its pathology, is obvious, not only from the symptoms just enumerated, but from the appearances exhibited in dissections of the dead.

That there exists, then, between the yellow fever of tropical climates, and that of the United States, and between the yellow fever of Spain and that of the United States, a resemblance tantamount to actual identity, satisfactorily appears from the foregoing exposition. But, by mathematical analogy, things similar to one and the same thing are similar to one another. Hence, the yellow fever of tropical climates and that of Spain are also alike. Exhibiting each a *perfect* resemblance to the yellow fever of the United States, their resemblance to each other must be *equally perfect*. Instead of being called the *yellow fevers* of particular places, they should be regarded as constituting, *collectively*, *the identical yellow fever of every place*, where moisture and dead organic matter abound, and an elevated atmospheric temperature prevails.

If, then, the yellow fever of tropical climates, of the United States of America, and of the South of Europe, be a unit, the cause productive of them must be also a unit. Under the existing constitution of things in the Universe, of which we form a part, identity of effect necessarily implies identity of cause. Were the case otherwise, that connection between cause and effect, on which the harmony and order of creation depend, and on which all our reasoning, and all our calculations, as to the future are founded, would be dissevered, and universal uncertainty and confusion would ensue.

To throw on this subject all the further light of which it is susceptible, and all that seems requisite, to establish the point for which I am contending, a succinct recapitulation of the principal identities exhibited by those diseases would seem to be important.

They arise and prevail only in places of the *same description*, during the *same season* of the year, and after and under the *same kinds* of weather as to humidity and temperature; and they are extinguished by the *same kind of change* in the weather. They attack particularly *natives* of the *same climates and countries*, and suffer *natives* and *habitual residents* of the *same climates and countries* to escape. When they take effect, they are in the *same manner graduated in their violence*, according as the individuals attacked are *natives* and *residents* of colder or warmer climates. The colder the region, where those affected have been born and reared, and the more recently they have left it, the more malignant and dangerous is their sickness.

But this is not all. The *characteristic symptoms* of those diseases are the *same*, their *type, course, and du-*

ration the same, and, as both symptoms and dissections satisfactorily testify, their particular seat and pathology, the same. To all of which might be added, that the most successful mode of treating them is the same.

Influenced by these identities, which are not only numerous but *vitally important*, we are compelled to believe, that the diseases which exhibit them, are necessarily the offspring of the same causes. The inference to this effect is not only legitimate, but irresistible.

III. *Is Yellow Fever a specific disease, or only a higher grade of the intermitting and remitting fever, endemical in hot climates?*

To this question a *direct* and *categorical* reply cannot be rendered. Nor, practically considered, would such a reply be of much importance.

That yellow fever belongs to the same *genus* or *family* with the intermittents and remittents of hot climates, there is no cause to doubt. They are all alike the offspring of the putrefactive process; or, at least, of the decomposition and recombination of organic matter. The same mode of prevention, therefore, is applicable to them all.

But whether they constitute, collectively, the *same specific disease*, modified only by higher and lower grades, like the *distinct* and *confluent* smallpox, or the *irritative* and *congestive* forms of typhus fever, may be seriously questioned.

Although, as just stated, the yellow fever, and the intermitting fever certainly arise from a common source, they require, for their production, very different kinds of weather. To generate the former, *hot and dry weather is essential*, a sufficiency of rain having previ-

ously fallen. To produce the latter, weather *moist and moderately cool* is most suitable. Such is unquestionably the general rule, to which, if exceptions occur, they are *but* exceptions.

That a long continuance of hot and dry weather may produce, by putrefaction, (by which, I always mean, the natural decomposition and recombination of organic matter,) a poisonous gas materially different from that arising from the same process, under the influence of moist and cool weather, is, by no means, improbable. On the contrary, it is an event which we have reason, perhaps, *on principle*, to expect. And, as far as analogy may avail, it favours the expectation. Of direct evidence, on the subject, we have none.

Marsh miasma is the poisonous gas to which I have referred.

Without pretending to any knowledge of the real nature of that substance, let us, for the sake of illustration, suppose it to be composed of oxygen, hydrogen, and nitrogen, or any two of these ingredients.

It is a principle in chemistry, that, in the formation of compound bodies, a greater or less proportion of any of the constituent parts, entering into the compound, or those parts uniting, perhaps, with each other more or less perfectly, produces, in the result, a material difference. In illustration and proof of this, a number of pertinent examples may be adduced.

Carbonic oxid and carbonic acid, formed by different proportions, and probably different degrees of union, of the same elements, differ from each other exceedingly, both in their nature and their properties.

The same is true of the phosphorous and the phos-

phoric acids, the sulphureous and the sulphuric acids, the arsenous and the arsenic acids, the several modifications of the muriatic acid, and, more especially, the various nitrous and nitric productions, arising from the union of oxygen and nitrogen. I might add, that, by fermentation and distillation, carried on under different circumstances, compounds differing greatly from each other arise out of the same elementary ingredients.

In the formation of these compounds, the process is probably more active and vigorous in one case than in another, and the relative proportions of the component parts, as well as their degrees of union, different, the parts themselves being in substance the same. But, be this as it may, in their nature, properties, and modes of action, the compounds thus formed out of the same ingredients, are widely different.

In relation to the deleterious gas, resulting from the natural decomposition and recombination of organic matter, the same thing may be true; and hence it may be productive of different diseases. The poison of YELLOW may bear to that of *intermitting* fever, the same relation that the strongest of the acidified compositions bears to the weakest.

But, perhaps the most solid ground of belief, that the yellow and intermitting fevers do not arise from the same specific poison, differing only in *degrees of concentration*, is, that they never, in the same place, prevail at the same time. Did the causes producing them differ only in strength, as wine diluted with water differs from pure wine, the phenomena presented to us would be different. In that case, the miasmata, acting as from a center to a circumference, would produce, at and near

to the source of exhalation, *yellow fever*, within limits more remote, *remitting fever*, while at points remoter still, *intermittents* would prevail.

But such a series of phenomena never presents itself. Wherever genuine yellow fever reigns, *as an epidemic*, it reigns *alone*. Within the sphere of action of its poison, no other febrile disease, smallpox, perhaps, excepted, can cotemporaneously exist. And even *it* does homage to the dominant distemper, by submitting to be characterised by some of its symptoms. (c)

Hence, when yellow fever prevails in Philadelphia, it is most malignant in *water street*, where it always first appears, and which constitutes the low ground of the river Delaware. In *front*, and more especially from that to *second street*, where the ground is higher, and more remote from the river, the disease is less violent, and toward the more elevated and distant grounds of third, fourth, and fifth streets, where it usually terminates, it becomes still lighter.* But, throughout its whole range, its type is the same. It continues to be every where *yellow fever*, although, in different places, of very different grades. Under its lightest and simplest modification, it is less severe, and more easily cured, than intermitting fever. Yet, in type and character, it is as different from that disease now, as when marked by its highest grade of malignity. Its strength and power to injure are gone, but, in its form, it has suffered no mutation.

*The author does not deny that many malignant and fatal cases of yellow fever occur at considerable distances from the river. But he asserts the general rule to be, that, as it recedes from the river, the disease becomes *lighter*.

Did the yellow and the intermitting fever arise from the same poison, differing only in concentration, and strength, the following phenomena, in epidemic seasons, would be likely to present themselves, in the city of Philadelphia.

In water street, would be found *malignant* yellow fever, in front, and towards second street, the same form of disease, but less violent, from second to third street, remitting fever, while from third to fourth and fifth, intermittents would prevail.

But as nothing of this description takes place, yellow fever reigning *alone*, whenever it occurs in an epidemical form; and as, for the production of it and intermitting fever, different and almost opposite kinds of weather are requisite, it appears most probable, that, although of the same family, their common parent being the putrefactive process, they are the immediate offspring of different poisons. But those poisons attack the same organs of the body, and each produces a gastric form of disease.

What I have said of Philadelphia, in relation to the gradations of yellow fever, in Water, Front, Second, Third, Fourth, and Fifth streets, is equally applicable to the varieties under which that disease appears, in the lower and the more elevated streets, of New-York, Baltimore, and other large commercial cities. Wherever the complaint occurs, it always appears first, and assumes its most malignant character, in depressed and humid situations, and intermittents are never its concomitant.

Finally, it has been already observed, that the natives and acclimated inhabitants of intra-tropical regions enjoy an exemption from yellow fever. But, in relation

to intermittents, they have no such immunity, being as liable to *them*, as the inhabitants of other places. Did those two forms of fever arise from the same specific cause, it does not seem probable, that individuals proof against the poison in a *concentrated*, would be injured by it in a *diluted* condition.

IV. Does it prevail as an epidemic in the low grounds of the seacoast only, where it has heretofore appeared, leaving the more elevated situations untouched?

Although yellow fever has prevailed most extensively, and, in the main, in its most malignant form, in low maritime situations, it is not *necessarily* confined to *them*. In interior situations, on the borders of lakes, and the margins of rivers, it has often appeared with alarming mortality. Corroborative of this, testimony, in the United States, may be drawn abundantly from the flats of Lake Ontario, and the banks of the Ohio, the Arkansas, and the Mississippi. Nor, were such testimony wanting here, could we fail to collect it on the borders of rivers in South America, Africa, and some parts of India.

In fact, this disease is the native growth of every extensive tract of low ground, whether maritime or interior, where a sufficiency of heat and moisture prevails, and dead organic substances abound.

But, in elevated and dry situations, yellow fever has never prevailed, in an epidemic form; nor can it so prevail, unless by the want of wisdom, or the carelessness of man.

Did a large and populous city occupy such a situation, were its police so unwise and inattentive as to suffer humidity and filth greatly to accumulate and remain

in the streets, and, under these circumstances, should a dry, hot, and epidemic season occur, real yellow fever *might* be the issue. But, as such a concurrence of causes can scarcely take place, it is not material that we dwell on its result. In the main, yellow fever, endemic or epidemic, is not to be looked for on elevated grounds, and in inland situations.

V. Does yellow fever appear more frequently as a sporadic complaint, and only occasionally as an epidemic, during the hottest season of the year?

In a sporadic form, this disease always exists in tropical climates; but, in temperate and cold ones, sporadic yellow fever rarely appears. During twenty years of ordinary health, a physician in Philadelphia, engaged in extensive practice, will hardly meet with a dozen of such cases—perhaps not half so many.

In years of disease, when a deleterious constitution of the atmosphere prevails, attacks which *appear* sporadic, are often, for several months, precursors of the complaint in its epidemic form.

In those years in Philadelphia, in which the fever began to prevail epidemically in August, cases *seemingly* sporadic, made their appearance, on several occasions, during the months of May, June, and July, and, in the year 1798, as early as the month of April.

But in strict language, such cases ought not, perhaps, to be denominated sporadic, as they are evidently connected with the general state of things, which produces ultimately the impending epidemic. The confirmed prevalence of almost every epidemical distemper is thus ushered in by scattering cases, as, in war, the skirmishing of advanced parties usually precedes the heat of the

battle; and, in the physical world, the "grey of morning" is the uniform harbinger of the "full-blown day."

During the memorable pestilential period, which, in the United States, as well as in the West Indies, and a large portion of South America, extended, with but little interruption, from the year 1793 to that of 1805 inclusively, many sporadic cases of gastric disease, strongly resembling yellow fever, occurred in Philadelphia, and I believe also in New York, Baltimore, and elsewhere, even during the winter season. A summer temperature would have rendered them much more malignant and fatal. It would, no doubt, have clothed them in all the characteristic symptoms of real yellow fever. They furnished incontestible evidence of the existence of a deleterious constitution of the atmosphere.

In temperate climates, yellow fever can appear *epidemically* only during the hottest season of the year. But, during no season, as already stated, can the sensible qualities of the atmosphere *alone* produce it *in that form*. It is *therefore* that it occurs in such a form *only occasionally*, and not *uniformly* and *necessarily* in every instance, when a high temperature and an arid state of the heavens concur to invite it.

Intense and long continued heats are essential to the generation of it; and so, in most instances, is protracted drought. But, I repeat, that, for the production of it, *in an epidemical form*, these two conditions of the atmosphere, aided by putrefaction, do not appear to be alone sufficient. As a further auxiliary, a *general constitution of the season, favourable to the generation of malignant fever* is essential. Without the latter, yel-

low fever has never been epidemic in any part of the United States.

In confirmation of this, summer and autumnal diseases, generally, in whatever section of our country they have appeared, have never failed to be unusually violent, at the times of the epidemic prevalence of yellow fever in our commercial cities. In further corroboration of the same point, when no manifestation has been given of an existing constitution unfriendly to health, some of our hottest and driest summers have passed away, without giving rise to the disease as an epidemic. They have produced sporadic cases, and nothing more.

From the foregoing view of things, my reply, in brief, to the question I am considering, is,

That, in temperate climates, yellow fever does not often appear in sporadic cases, and that it prevails only occasionally in an epidemic form, during the hottest seasons, when to a temperature inordinately high, is added a congenial constitution of the atmosphere.

VI. In the most violent and malignant form of yellow fever, is anything secreted and thrown out from the body, which can communicate the disease, either directly or indirectly, from the sick to the well?

The nature of my reply to this question, which virtually embraces, in itself, all that is most important in the others, may be easily anticipated, from sentiments which I have already unreservedly expressed.

But, that this reply may, in all its relations, be the better understood, by being accompanied by whatever of illustration I am prepared to bestow on it, I shall here, as clearly and succinctly as practicable, enunciate

my chief reasons for believing, that, under no circumstances, can yellow fever prove contagious; and, that, to become so, it must first cease to be yellow fever, and turn to some other very different complaint.

By way of preliminary, it will be permitted me to observe, that a mere increase in the *malignity*, effects no real change in the *nature*, of a disease; and that a complaint, *contagious* in *any* form, is so in *every* form it can assume, otherwise it is no longer the *same* complaint. In proof of this, *distinct* is equally communicable with *confluent* small pox; and lues venerea, in a *simple* shape, with the same disease in the most *complicated* and *alarming* shape it can put on.

In like manner, if yellow fever be contagious at all, it must be as essentially so, in mild and manageable, as in the most malignant and intractable cases.

That it is not communicable *by contagion*, either directly or indirectly, from the sick to the well, appears satisfactorily from the following considerations.

1. It prevails *only* during a *certain season* of the year, and under a *given* temperature and constitution of the atmosphere.

This is true in relation to *climates without the tropics*. The disease prevails *there*, only in summer and autumn, during a high temperature, and a malignant or pestilential constitution of the atmosphere. If it be, in an endemic or a sporadic form, perpetually prevalent in tropical regions, it is because, *there*, the requisite temperature never ceases to exist.

But this is no characteristic feature of a disease, that is essentially and absolutely contagious—that possesses unequivocally, *an inherent power of self-propagation*.

Of a disease of this description, small pox affords the *most perfect example*. Among febrile diseases, perhaps the *only* perfect example.

Of *its* contagion no doubt has even been expressed, because it rests on evidence that is *indubitable*.

Analytically considered, this evidence is, that the complaint may be propagated by a *voluntary* act, in a way that is *visible*; that it is communicable *casually*, at all times, and in all places, in the spring, the summer, the autumn, or the winter; during a condition of the atmosphere, humid or dry, intensely hot, agreeably temperate, or severely cold; in situations elevated or low, maritime or interior; in cities or in the country, near rivers or lakes, on plains, among hills, or in mountainous regions.

Unless a complaint be communicable under all these circumstances, no matter by what name it may be known —yellow fever, typhus, or pestis vera, it is not of a nature unequivocally contagious.

That yellow fever cannot be thus communicated, is universally acknowledged. The attribute of contagion, therefore, does not belong to it.

2. When this disease prevails epidemically, its commencement can never be traced to an intercourse with contagion, but always to a source of deleterious exhalation.

By all intelligent and observing physicians, who have had experience on the subject, and by a very large majority of the most enlightened inhabitants of the commercial cities of the United States, the truth of this assertion is no longer questioned.

On every fresh occurrence of yellow fever, in an epi-

demical form, in Philadelphia, New York, and Baltimore, fresh attempts, the most zealous and active, were, for many years, perseveringly made, to trace the distemper to a contagious source. But in vain. The nidus of contagion was never discovered. In Philadelphia, the origin of the disease was universally found in the contaminated atmosphere of the low ground of the river Delaware, and in similar situations in the other cities.

Having been myself very repeatedly engaged in this investigation, I pledge, for the truth of my statement, whatever of reputation and standing I possess. Were other testimony wanting, the most ample and substantial might be easily adduced.

3. In a pyre atmosphere, it is never communicated from the sick to the well.

Fortunately for the comfort and welfare of the diseased, and the general interest of the human family, the truth of this is no longer questioned. In Philadelphia and elsewhere, the experiment has been made so repeatedly, on a scale so extensive, and in a manner so decisive, as to satisfy reasonable doubt, and silence even prejudice and clamorous scepticism.

When, in that city, the disease prevails epidemically, and in the most malignant form, in Water, Front, and Second streets, cases removed thence to the higher ground and purer air of Third and Fourth streets, never communicate it. So true is this, and so confidently is the truth recognized now, that, in the latter places, those confined by yellow fever are nursed and attended, as in other complaints, without the slightest dread of

contagion. Nor, by this intercourse, has a case of sickness ever been produced.

When the disease appeared in Philadelphia, in 1793, and for several years afterwards, its reputed contagion spread terror and dismay through the surrounding country. An individual from the city, while the fever was prevailing in it, was dreaded and shunned, as if he breathed forth the deadliest poison, in a visible form. But the scene is changed. Time, the test of truth, united to experience, the parent of knowledge, has dissipated apprehension, and no one, now, dreams of the complaint being propagated in the country by means of contagion. Hence, when the city is diseased, the inhabitants retreat to the neighboring villages, where they often sicken and die, without being regarded as sources of danger, and deserted, as formerly, or, in a single instance, infecting the individuals who linger in their chambers and minister to their wants. If these facts are not recorded as extensively as they might be, it is because they are so numerous and familiarly known, and, therefore, so much matters of course, that no one, now, thinks it important to report them.

During the prevalence of yellow fever in Philadelphia in 1793, the general hospital for the accommodation of the sick was established at Bush-Hill, about three miles from the seat of the epidemic.

To the wards of that asylum was conveyed an immense number of diseased individuals. It is hardly necessary to remark, that into such a receptacle, the very worst forms of the complaint would necessarily find their way. Although every thing practicable was done to effect it, cleanliness in the hospital could not be pre-

served. The establishment had been very hastily and defectively prepared, in the midst of great confusion, and a want of means. The nurses, in the beginning, were inexperienced and unfaithful; and even of that description, a competent number could not be procured. The consequence of such a state of things must be readily perceived.

By exhalations from the sick, the dying, and the dead, the atmosphere of the building was thoroughly impregnated. From the neglect of those in attendance, portions of the floor were often covered with the matter of black vomit. Owing to the same cause, the natural excretions of the patients were not, at all times, very promptly removed. For want of more suitable apartments, the nurses and attendants ate, drank, and slept, in the wards of the sick. Nor were any precautions employed—indeed, in such a place, none could be employed, to guard against infection.

Had contagion existed, a more suitable arrangement for the propagation of fever by it, could scarcely have been imagined. The closing of the doors and windows of the edifice would have rendered it complete. Yet nurses nursed, attendants waited, and physicians visited, without the production of a case of disease. The sick introduced from the pestilential section of the city excepted, the establishment presented, throughout the season, uninterrupted health.

Of such notoriety are these facts, and so authentic is the ground on which they are reported, that I purposely decline to adduce evidence in support of this statement. For an abundance of it, I might refer to

most of the American medical publications on yellow fever, dated about the close of the last century.

But, for proof that this disease cannot be propagated by means of contagion, I need not confine myself to the well known events of 1793. The history of the Philadelphia Hospital, during each succeeding epidemic, is precisely the same with that I have recited. Notwithstanding every possible exposure of nurses and attendants, the records of that institution do not, since its establishment, present a single instance, in which yellow fever was communicated from the sick to the well.

In relation to the hospitals of New York, Baltimore, and other cities of the United States, I am authorized to assert, that the same thing is true. *Their* records are alike free from cases of yellow fever produced by contagion within their walls.

The conclusion, then, is irresistible, that that disease is the creature of exhalation from putrefying filth, at least from the decay and chemical changes of organic matter, not of a secreted poison issuing from the sick and attacking the healthy.

4. This disease is perfectly under the control of the weather, and, on the occurrence of a change of season, suddenly ceases to prevail.

In the history of yellow fever, this is a circumstance of peculiar moment, because, when duly considered, it furnishes an argument against its contagion, which ought to be received as alone sufficient. A brief analysis of it will illustrate sufficiently its bearing and force. Let the seat of the epidemic be the city of Philadelphia, where I have been accustomed to observe it.

September and October being warm and dry, the disease rages without abatement, many new cases occurring daily.

On the first of November the northeast wind begins to blow, the sky is soon darkened by heavy clouds, a rain of several days succeeds, terminating, perhaps, in a fall of snow, and the mercury sinks from fifteen to twenty-five degrees of Fahrenheit. Autumn passes precipitately into winter.

On the first occurrence of this change in the general state of the atmosphere, many persons, who have already received into their systems the seeds of disease, will be likely to sicken; and not a few, perhaps, of those who are ill of it, will be rendered worse. *But the epidemic is at an end.* During the season, another case of it does not show itself. Did superstition prevail, the event, from its suddenness, might be ascribed, as similar events often have been, (*d*) to an immediate act of Divine interposition.

This picture, although seemingly a fancy-piece, is a correct representation of what has frequently occurred. On what principle, then, does the epidemic cease?

The city contains, *now*, ten times as many cases of fever as it did in the *second or third* week of August, when the complaint had been spreading, perhaps, twelve or fifteen days.

If it be contagious, whence is it, that *five hundred* persons labouring under it in November, cannot communicate it, in a single instance, *to any of their attendants*, while, in the month of August, *fifty* or even *ten* individuals affected by it, diffused it rapidly *through a whole community*? Has a mere change in the tempera-

ture of the weather altered entirely the nature of the disease? Did the bodies of the sick secrete a specific poison on the last day of October, and have they ceased to secrete it on the first of November, their disease being the same, for no other reason but because the mercury in the thermometer has fallen?—This cannot be. The cause assigned is palpably inadequate to the effect produced. Indeed, in relation to most of the sick, it has *substantially*, no existence.

In the chambers of disease the temperature has not generally fallen—not at least where comfort obtains—because, *there*, it has been maintained by the closing of doors and the kindling of fires.

Far from being ameliorated by the alteration in the weather, the fever, in many of those labouring under it, has been rendered, as already stated, much more severe and dangerous. But its nature continues the same. If contagion, then, were secreted by it *before* the change, it ought to be secreted more abundantly *now*; while the closing of the doors and windows of the sick rooms should give it, by confining and concentrating it, a much better opportunity to propagate disease.

Wherefore, then, I repeat, does the complaint so immediately cease to spread? The question is addressed to contagionists, and they are bound to answer it. Will they tell me, that the specified change in the weather, passing by the sick, suddenly alters, in such a degree, the susceptibility of the well, as to render them incapable of contracting the disease?—That, in a few hours, it so metamorphoses their very nature, as to bestow on them the privilege of being *contagion-proof*?

Such sophistry as this is unworthy of a reply, and shows the desperate condition of the hypothesis in favour of which it is employed.

The truth is, that the change of weather which has occurred, neither extinguishes, in the sick, the power to secrete contagion, nor, in the healthy, the capability of being affected by it. It acts on the atmosphere *without* the houses, destroying its pestilential character, not on the systems of individuals *within* them. It condenses and beats down the deleterious exhalation, which, empoisoning the air, had been the cause of the epidemic, and prevents its regeneration, by extinguishing putrefaction from which it arose. Hence the immediate cessation of the complaint.

Did the existence and propagation of the disease depend on contagion, the effect of the change of weather would be not only different, but opposite. In that case, the secretion of contagion by the systems of the sick still continuing, and the poison thus secreted being, as already stated, confined and concentrated by the closing of houses, febrile cases would be multiplied, rather than diminished in number. This induction is legitimate and cannot be resisted.

Like small pox, then, yellow fever, if contagious, would cease to prevail, only when it could no longer find susceptible subjects.

5. The disease cannot be communicated either by inoculation, or by any other mode of employing the secretions of the sick, nor yet by inhaling their breath, provided the experiments be made in an uncontaminated atmosphere.

Without entering into a circumstantial detail of them,

it will be sufficient to observe, that every experiment for communicating yellow fever, that man could undergo, or ingenuity devise, was performed, without effect, on his own person, by the late Dr. Firth, then of Philadelphia, during the epidemics of 1802 and 1803, and most of them afterwards published by him in his Inaugural Dissertation.

That intrepid experimenter slept not only in the same room, but on the same bed, with individuals ill of this disease, in its highest malignity. During their lives, he inhaled their breath, swallowed some of their blood, and smeared and inoculated himself with the same fluid. With their perspirable matter, the serum discharged from their blisters, their saliva, their expectorated mucus, and even their urine, and the bile taken from their gall bladders after death, he did the same. He opened and examined many dead bodies, and, during the process, exposed himself to every hazard he could think of.

But this was not all. With the matter of black vomit his experiments were numerous and greatly diversified. He rubbed it on his skin, introduced it into his eye, inserted it into his arm, in the way of inoculation, confining it in the lancet-puncture by means of sticking plaster, and inhaled the steam arising from it, first when recently discharged, and afterwards when lying on plates of heated iron. Nor did he stop here. Having dissipated, by heat, the liquid part of it, he made into pills the dark inspissated substance that remained, and swallowed a considerable quantity of it. Taking another portion of it, in a fluid state, he diluted it with water, and drank the mixture; and, to close his experi-

ments, swallowed two ounces of it undiluted, immediately after its ejection from the stomach of an expiring individual.

All these experiments, in presence of several witnesses, I myself being often of the number, Dr. Firth very repeatedly performed, and still retained uninterrupted health. While engaged in them, the only precaution he observed, was never to expose himself to the atmosphere of the pestilential section of the city. It is important to observe, that he had never in his person experienced the disease, nor been before exposed to it.

During the greater part of the time bestowed on these experiments, the temperature of the atmosphere was of that elevated degree, which is deemed best calculated to awaken the susceptibility of the system to the contagion of yellow fever. Indeed, nothing was left untried to render the course irresistibly conclusive. And such was the light in which it was regarded. No one assailed it by an objection or a cavil. Many who had, previously, been sturdy contagionists, abandoned their ground, and enlisted under the banners of the opposite party. Others who did not become immediately the open advocates of *non-contagion*, ceased to be its opposers. Of the force of evidence by which this change of sentiment was effected, the enlightened and liberal will judge for themselves.

6. Those physicians, who, from intellect and opportunity, are best qualified to judge and decide, are the most confirmed disbelievers in the contagion of yellow fever.

That by far the ablest class of writers on this dis-

case are *non-contagionists*, will not be denied by any one acquainted with the medical literature of the *present century*.

The works of the last century, on this subject, are, and ought to be, of less weight, because, at that period, the complaint was but very imperfectly understood. Yet, as far as they speak a decisive language, even *they* are, for the most part, opposed to contagion.

If human authority, then, may, in any measure, avail—and the *mere opinions* of distinguished characters ought not to be disregarded—it preponderates beyond calculation in favour of the doctrine I am endeavoring to maintain.

7. When yellow fever has made its appearance, as an epidemic, it spreads too rapidly to be propagated by contagion.

A febrile disease really contagious, ought to spread with a rapidity directly proportioned to its power of infecting. To the truth of this, as an axiom in medicine, every one must assent.

That the contagion of small pox is much more active and indestructible than that of yellow fever, (admitting the latter to *be* contagious,) cannot be questioned. But, in its progress through a city, the march of the latter is tenfold more rapid than that of the former. In the space of a month, yellow fever has often pervaded a community, which, by the unassisted action of contagion, small pox would not overrun in a year. The reason of this is obvious. The former complaint is propagated by a contaminated atmosphere, which every one must breathe and swallow, while the latter is communicated by a secreted poison, whose sphere of

action being very limited, may, with caution, be readily shunned. The one is a *local* and *visible*, the other a *universal* but *covert foe*. The first lurks chiefly in the chambers of the sick, the last, every where.

8. In overrunning a city, yellow fever does not pursue the *regular* march of a contagious disease, but spreads in a desultory manner, appearing in sundry remote and disconnected places at the same time.

9. A similar remark is applicable to its mode of spreading through a family. It does not, in its progress, pass gradually from one individual to another, but attacks several at the same time, or in a succession by far too rapid to be effected by secreted contagion.

The truth of these statements is familiar to every one who is observant of the movements of epidemic yellow fever. The facts they enunciate speak a language that cannot be misinterpreted, and furnish an argument not to be resisted. Fevers truly contagious *are* and *must be*, communicated *first* to those individuals most immediately exposed to their influence. Hence, nurses and attendants are the earliest sufferers; while others sicken in the ratio of their exposure.

But, in relation to yellow fever, this is not the case. Here nurses, attendants, physicians, and neighbours often escape, while, without having been near to the atmosphere of the sick, persons at a distance are unexpectedly attacked.

10 When yellow fever is prevailing, those who become its subjects can rarely trace their attack to an intercourse with the sick.

To such an extent is this true, that, more than *nine tenths*, I might say, *nineteen twentieths*, of the patients

I have interrogated on the subject—and my examinations have been numerous—have declared themselves unconscious of the source of their disease. Indeed, while the doctrine of contagion was predominant, the sick, at the commencement of their attack, scarcely ever believed their complaint to be yellow fever, on account of their ignorance whence it had been contracted.

11. The survivors of this disease, without cleansing them, often, with impunity, wear the apparel, sleep on the beds, and occupy the dwellings, of those who have died of it.

I allude here to what takes place *immediately after the season has changed*, and the epidemic disappeared.

That in every city of the United States, where yellow fever has prevailed, this event has repeatedly occurred, is matter of notoriety; and, in the West Indies, the practice is still more generally pursued. Indeed, in the latter place, purifications of the kind are rarely thought of. Nor does the neglect of them ever become subversive of health.

In the estimation of all who discard prejudice, and view things as they are, these facts *must* prove fatal to the belief, that the poison of yellow fever may be conveyed from one country to another, in clothing or merchandize. As well might we talk of gathering up and carrying to a distance the prismatic spectrum, after the sun has withdrawn his beams, or the tones of a piece of music, after the chords of the instrument emitting them have ceased to vibrate.

12. Yellow fever having appeared *in an epidemic form*, can never be extinguished until the change of the

season, by the most rigorous separation of the diseased from the healthy.

That this is true, the records of the proceedings of the Boards of health, in Philadelphia, New York, Baltimore, and elsewhere, *with their uniform failure to eradicate the disease*, conclusively testify.

In relation to small pox, the case is otherwise. By immediately removing the sick to a hospital, and prohibiting intercourse between them and the healthy, that disease has been *often* extinguished. In this way, when not epidemic, its progress may be *always* arrested. The reason is manifest. *It* is communicated by contagion alone, which is thus avoided; whereas to check and extinguish yellow fever, whose source is in the air, you must revolutionize the contaminated portion of the atmosphere, an achievement to which, in the present state of science, the powers of man are incompetent; or you must prohibit individuals from entering that portion, the only preventive expedient on which we are authorized by experience to rely.

13. Yellow fever, when it prevails extensively, is always preceded, accompanied, or followed, by certain phenomena in the vegetable or animal kingdom, or in the Heavens, which testify to its connection with the constitution of the atmosphere, and, therefore, proclaim it a *genuine epidemic*.

The phenomena alluded to are various.

As connected with the Heavens, they are, inordinate heat and drought, preceded or followed by excessive rains. Lightning and thunder, luminous meteors, and other electrical phenomena are defective or superabundant, the atmosphere is unusually smoky or foggy, calms

or winds that are not customary prevail, or storms and tempests are more than ordinarily frequent and violent.

As relates to vegetables, their growth is excessively luxuriant or defective, they are unusually sickly, especially in their fruits and seeds, and certain diminutive and parasitical plants appear in crops inordinately abundant. Hence, epidemic complaints, which are often attributed to the diseased vegetable productions of the year, are nothing but *concomitants* of those productions, arising from a common cause. And this cause is to be found in the peculiar constitution of the atmosphere.

With respect to the animal kingdom, many species of it are subject to the same distempers with man. This is more especially the case in relation to our domestic animals. Hence, in Philadelphia and other cities of the United States, epidemic yellow fever has been repeatedly ushered in and accompanied by sickness among dogs (*e*) and hogs, and an unusual mortality among cats. So true is this, and so generally observed, that disease attacking those animals, in the summer season, is considered premonitory of the approach of *human* disease.

Homer, therefore, in describing the pestilence, which wasted the Grecian forces, while besieging Troy, is no less of a historian than a poet, when he tells us, that

“On dogs and mules the infection first began,
“And last its vengeful arrows fixed in man.”

By the slaughterers of hogs, for the Philadelphia market, in 1793, when yellow fever prevailed in that place, it was observed that the livers of those animals were unusually diseased.

But *domestic* animals are not the only sufferers, during years of epidemic sickness. Wild quadrupeds, undomesticated birds, and even the *inhabitants of the waters*, are known to participate, at times, in the calamity. For numerous facts confirmatory of this, the reader is referred to the first volume of Webster, "On epidemic diseases."

Another phenomenon, not unworthy of observation, presented by the animal kingdom, during periods of epidemical disease, is a superabundant production of insects and worms. That this is true, in the United States, a faithful record of several of our sickly seasons would satisfactorily demonstrate; and, in the climates of the east, the locust, the grasshopper, and the palmer worm, are the usual companions of epidemical pestilence.

In the summer of 1798, one of the most calamitous epidemic years that Philadelphia experienced, the country around it was unusually infested by grasshoppers and caterpillars. In a lower degree, the same thing was true of the summer of 1802. And, in 1797, the mosquitos within the city were almost as annoying as the disease itself. Nor was there any thing peculiar in the *sensible* qualities of the atmosphere, to aid us in accounting for these phenomena. Yet, within the recollection of the oldest inhabitant of the place, such a superabundance of those insects had not previously occurred.

Their productiveness, then, during that year, must have arisen from some quality in the atmosphere not cognizable to the senses. In other words, from its *constitution*.

For much curious and valuable information, on this

subject, those who may be desirous of it, are referred to Webster's History of epidemical diseases.

13. In the true character of an epidemic, yellow fever either banishes, during its prevalence, all other febrile diseases, or imprints on them many of its own features.

Even before the *actual occurrence* of yellow fever, other febrile diseases often disappear, so that the epidemic is immediately preceded by a short period of unusual health.

As far as I have reflected on the subject, there appears to be but one principle, on which this fact can be satisfactorily explained.

Most febrile diseases are the result of atmospherical influence. *Epidemic* fevers are necessarily so.

While the atmosphere is undergoing that change, whatever it may be, which is requisite to qualify it to co-operate efficiently in the production of yellow fever, it passes first into what, may be denominated a *medium or neutral state*—a condition not congenial to any given disease. It is not yet prepared for the generation of yellow fever, but is so far altered as not to favour the existence of other febrile complaints. On the contrary, it prevents such existence. In this state of things, disease makes a pause. But it is like the calm which often precedes the hurricane. Nature seems to be taking breath, as if preparatory to some fearful exertion. By the operation of certain undiscovered causes, the epidemic constitution is at length matured, yellow fever appears, and, until a change in the season, *reigns alone*. By the agency of a mere secretion of the body—and contagion is nothing else—this autocracy could never

be attained, because, by a power so limited, the qualities of the atmosphere could never be controled. Yet they *are* controled, and reduced to a congeniality with the nature of yellow fever, else all other febrile complaints would not disappear, and that prevail without a rival.

In opposition to the sentiments here advanced, it is contended by some, that two epidemical febrile diseases may *prevail* in the same place *at once*.

Such an event is impossible. As well may two bodies occupy simultaneously the same point of space, two *general* diseases prevail *at once* in the human system, or the same thing be and not be at the same time.

One epidemic may so immediately succeed another, that before the *last attacks* of the *preceding* shall have ceased, the *first* of the *succeeding* shall have made their appearance.

In this state of things, like light and darkness in the formation of twilight, the two diseases *intermingle* their cases. But, for them both to *prevail*, at once, *in full force*, in the same situation, I repeat, is impossible. As soon shall we witness the simultaneous existence of the gloom of midnig' t, and the blaze of noon.

It is indeed possible for two febrile diseases, *apparently* different, to prevail epidemically at the same time within the same community.

Among those, for example, who have never before experienced that disease, *scarlatina* may exist, while parturient females shall be attacked epidemically by *puerperal fever*.

In this case, the latter disease is nothing but the former concealed under *a mask*.

When *scarlatina* is spreading vigorously as an epidemic, the diathesis predisposing to it exists very generally, as is often manifested by a prevalence of somewhat of the exanthematous affection which belongs to that complaint.

Under these circumstances, puerperal fever is nothing else than the general inflammatory diathesis of the time, thrown on the pelvic and abdominal viscera, by the influence of gestation, and ripened into actual disease by parturienty, as an *exciting cause*. Under the rubeolous and the bilious diathesis, the same event has repeatedly occurred.

To conclude this head of my subject, I venture to assert, that no one can render a single reason in support of the notion that yellow fever is contagious, which may not be applied with equal pertinency and force, to establish a belief in the contagious nature of intermittents, or any other form of bilious disease. Nor can an argument be advanced against the contagion of the latter complaint, which may not be urged, with equal effect, against that of the former.

But, say some, although not *absolutely* and *always* so, yellow fever is contagious "*under certain circumstances.*"

When brought to the test of strict analysis, this position is discovered to be not only without foundation, but without a meaning.

There are no *half-truths* in medicine any more than in religion. Man is either a saint or a sinner, because piety and impiety can never amalgamate with each other.

In like manner, disease *is* contagious, or it *is not.*

To assert it to be neither the one nor the other, is to utter an absurdity. A complaint contagious only "under certain circumstances," is not contagious at all.

Contagion is a secreted poison, deleterious *per se*, in its relationship to man, and must act at all times in conformity to its nature. To render it either *inactive*, or *inn cent* in its action, you must *change* its nature. Unless thus changed, it will poison not "under certain circumstances" only, but under *all* circumstances, as certainly as oxid of arsenic, prussic acid, or the juice of the Ticunas.

What *are* the circumstances under which the contagion of yellow fever *will* poison, and those under which it will *not*? The advocates of the doctrine have never yet informed us.

If they consist in any peculiar alteration in the *nature* of the poison, it is a poison no longer. Nor can it regain its power to injure, by any mere change of either time or place. If it lose this power in November, it cannot recover it in July or August following. Nor, if it lose it in Philadelphia, New York, or Baltimore, can it regain it by a transportation to the West Indies, or the South of Europe. Yet, that it *can* and *does* thus lose and recover its deleterious qualities, has been *virtually* if not *expressly* asserted. On the absurdity of such a notion, it were superfluous to dwell.

But, perhaps it will be contended, that the circumstances under which the contagion of yellow fever acts, consist in a peculiar susceptibility of the human system, which is *developed* during a part of the year, and lies *dormant* during the remainder—which, in temperate

latitudes, is *awake* from July until November, and *asleep* from November until July.

This hypothesis, although attempts have been made to sustain it, is too ludicrous to be seriously considered. In relation to it, therefore, I shall only observe, that did the system of man, on the passage of autumn into winter, lose its susceptibility to the poison of yellow fever, it is scarcely possible that its susceptibility to some other poison would not be also affected by the change. But, that such is not the case, is universally known.

I do not perceive that I can, in any other way, more suitably conclude this head of my subject, than by introducing a quotation from my manuscript lectures, on the same topic.

“ Why should the supposed contagion of yellow fever, when exceedingly abundant, suddenly cease to act in the city of Philadelphia, in the month of November, and, when infinitely less in quantity, act again with vigour, in the same place, in the month of August of the succeeding year? Wherefore should it lie dormant *nine* months in the year, and be awake only *three*? Or, to vary the question, why should man’s susceptibility to its action sleep so much, and be awake so little? Is there, within the compass of nature, another poison against which, *by any change, or on any principle*, the human system is proof *nine* months in the year, and liable to be afflicted by it only *three*? If there be, the advocates of contagion are called on to indicate it.

“ How is it with the poison of small pox, of lues venerea, of variola vaccina, of rabies canina, of arsenic of opium, of laurel water, or any other, native or morbid, that creation affords? Does either of them lose

its power of action, or to either of them does man lose his susceptibility, *three fourths* of the year, and regain and hold possession of it during the *other fourth*?

“These questions, I say, are proposed to contagionists. Let them either answer them rationally, on principles consistent with their favourite hypothesis; or abandon that hypothesis, as visionary and untenable.

“In fine, a disease which can prevail only *at a given time, in a given place,* and under a given condition of the atmosphere, is indebted for its existence, not to an inherent power of self-propagation, but to the combined influence of *season and temperature, topographical situation, and atmospherical constitution.* If this be not sound sense, as well as sound science, I have no knowledge of either.”

VII. *What degree of temperature is necessary to produce the disease, (yellow fever,) and render it epidemic, and to what degree of north latitude has it heretofore extended?*

In reply to the first branch of this question, I can furnish nothing more appropriate than an extract from an essay on yellow fever, which I published in Philadelphia in 1807. After representing that disease as an indigenous production of tropical climates, the Essay proceeds as follows.

“It is necessary to observe, that in intra-tropical countries, particularly in plains and maritime situations, the mean annual temperature of the atmosphere is about 80 deg. of Fahrenheit; (*it is in reality from 80 to 83 deg.*) Accordingly, therefore, as the temperature of our summers (in Philadelphia,) continues as high as 80 deg. of Fahrenheit, for a greater or less proportional

part of their duration, in the same ratio must they be said to resemble real tropical seasons.

It is well recollect by our citizens, that the summer and autumn of 1793, (the year in which yellow fever made its first appearance, and produced its greatest mortality, in Philadelphia,) were extremely hot and dry. The state and temperature of the atmosphere were of a character truly tropical. But, as I have no actual register of the weather for that season, I cannot include it in my comparative view.

"Within the last eleven years, that is, since the beginning of the year 1796, yellow fever has prevailed in Philadelphia six times, namely, in 1797, 1798, 1799, 1802, 1803, and 1805. In 1796, 1800, 1801, 1804, and 1806, we were exempt from it. Of these eleven years, I have had access to a meteorological journal of only eight, viz. 1796, 1798, 1799, 1801, 1803, 1804, 1805, and 1806. Of these eight years, four, as above stated, were marked by the prevalence of yellow fever, namely, 1798, 1799, 1803, and 1805; whereas, in the other four, viz. 1796, 1801, 1804, and 1806, that disease did not make its appearance. Let us, now, taking the mean of tropical heats, namely 80 deg. of Fahrenheit, as a standard, compare the temperatures of these eight summers with each other.

"During the summer of 1796, the mercury rose to the standard of 80 deg. for only twenty-four days, and we had no yellow fever. During the summer of 1798, it rose to the same standard for as many as forty-one days, and we had yellow fever. During 1801, for thirty-two days—no yellow fever. During 1803, for fifty-one days—yellow fever. During 1804, for thirty-two

days—no yellow fever. During 1805, for sixty-eight days—yellow fever. During 1806, for thirty-four days no yellow fever.

"These several summers, with their temperatures and effects, as to the production of this disease, may be thus arranged in a tabular form: viz.

Summer of	1796	Temperature	80 deg. for 24 days,	No Yellow Fever.
do	1798	do	80	41 do Yellow Fever.
do	1799	do	80	45 do Yellow Fever.
do	1801	do	80	32 do No Yellow Fever.
do	1803	do	80	51 do Yellow Fever.
do	1804	do	80	32 do No Yellow Fever.
do	1805	do	80	63 do Yellow Fever.
do	1806	do	80	34 do No Yellow Fever.

"This simple statement, as far as it goes, seems to operate with demonstrative force. It sets forth, in a manner the most clear and satisfactory, *first*, that yellow fever cannot, or at least, does not, break out in our city, except as the consequence of a long continuance of tropical heats and *secondly*, that such a continuance of these heats has very seldom, of late years, failed to produce it. It teaches us, that if, during the course of the summer, the temperature of the atmosphere does not rise to 80 deg. of Fahrenheit, for more than thirty days, no apprehension need be entertained of the appearance of disease; but, that if, on the other hand, the temperature attain such an elevation, for forty days, or upwards, the public health is seriously endangered."

The work, from which this extract is derived, was published, as appears from its date, nearly twenty years ago.

Since that period, the facts which it contains, even the entire substance of it, have been stated, in various publications, treating of the causes of yellow fever. But, as far as the author of this memoir is informed.

no reference has ever been made to the work in which they originally appeared. Whether this omission to quote was *intentional* or *accidental*, the liberal and enlightened will judge for themselves.

The facts and observations referred to, never did appear in any work in this country, nor, as far as the author is informed, in any other, until long after he had published them, first in a Philadelphia newspaper, (he believes it was the *True American*,) and afterwards in his *Essay on the Yellow Fever of 1805*, which was not printed until the year 1807.

Such, then, were my sentiments, on the present subject, in 1807, and I have, since that period, found no reason to change them. I shall, however, repeat the belief which I have already avowed, that, without the concurrence of a favouring constitution of the atmosphere, the specified temperature will not produce *epidemic* yellow fever. The stronger that constitution is, the less amount of tropical heats is requisite for the effect.

In reply to the second branch of the question, I shall observe, that, in the United States, yellow fever has never appeared, in an epidemic form, northward of Boston, which stands in 42 deg. 22 min. N. latitude. Even there its prevalence has been limited both in extent and duration; and has occurred, I think, but twice within the last thirty years.

But the summers of the United States are considerably hotter than those of Europe in corresponding latitudes. The difference is equal to a difference in latitude of six or eight degrees. According to this rule, from the thirty-fourth to the thirty-sixth degree, ought to constitute the northern boundary of yellow fever.

in the old world. But that parallel lies to the southward of Spain, where the disease has prevailed with great malignity. Italy has been also the theatre of its ravages.

To the northward of those two countries, I do not know that, in Europe, real yellow fever has ever appeared, in an epidemic form.

Along the borders of the German sea, and even of the Baltic, malignant bilious fevers prevail. But severe and fatal as they often are, we cannot, I think, bestow on them the name of *yellow fever*. In that case every violent bilious fever might be so denominated.

VIII. *May not the disease arise and prevail, as an epidemic, on the seacoast of northern Europe, especially on the northwestern borders of Germany, during the hottest months of summer, or is it peculiar to warm and tropical climates?*

From the sentiments already advanced, under the head of the last question, my reply to the present one may be easily anticipated.

In the ordinary course of things, in no part of northern Europe, maritime or interior, is it probable that yellow fever can arise and epidemically prevail. Under the influence of an *extraordinary* season, such as can scarcely be looked for *once in an age*, the event is *possible*. For, throughout nature, an identity of cause can never fail to produce an identity of effect. Copious falls of rain, therefore, having preceded a summer of inordinate heat and drought, co-operating with a *highly deleterious* constitution of the atmosphere, may, even in northern Europe, become productive of epidemical yellow fever.

But, under the ordinarily short and temperate summers of that region, I repeat, that the event is not to be dreaded. Earthquakes *may* occur, and volcanos burst forth, in places which, previously, they had never annoyed. But these are *exceptions* to that *general course of things*, on which the calculations of philosophy must be founded.

In sporadic cases, yellow fever *may* appear in *any* region. But, epidemically, it is as peculiar to *warm and tropical* climates, as the *olive* or the *plantain*. In northern Europe, those plants may be reared, in the atmosphere of a hot-house. But they will be stunted and feeble, and their artificial existence precarious and short. For the *olive*, the climate must be *warm*, for the *plantain, tropical*.

Such is the case with yellow fever. Perhaps within even the arctic circle, an artificial hot-bed of disease, or an extraordinary season, may produce it; but not in its native luxuriance and vigour.

IX. *Should question VI, respecting the contagious nature of yellow fever, be answered in the affirmative, must we not, then, conclude, that the disease, although not capable of arising and spreading as an endemic or epidemic, on the seacoast of the north, on account of the low summer temperature of those regions, may yet be introduced and propagated there in a contagious and sporadic form, by vessels arriving from its native climate, having on board infected merchandise, individuals, or clothing?*

My reply to this has been given already, under the head of question VI.

Yellow fever, not being contagious, cannot be com-

municated in any form, sporadic or epidemic, from its native regions to the north of Europe.

Were it contagious, it *might*, and *necessarily* and *repeatedly would*, be thus communicated. Not a seaport of either Great Britain, Ireland, or the continent of Europe, could escape it. The fact, then, that they do escape, is a powerful argument against its contagion.

Render this disease as contagious as small pox—and, according to the representations given of it by contagionists, it is much more—and, her intercourse with tropical countries continuing as at present, Europe, continental and insular, not excepting even Russia and Norway, must annually suffer from it, in her maritime borders. Under these circumstances, its existence and ravages must become as extensive and perpetual, as the spread of commerce. In prevention of the calamity, measures of quarantine will prove unavailing.

To show that I do not thoughtlessly hazard this assertion, let us suppose the West Indies, and other intra-tropical countries, to be the *perennial* birth-place, not of yellow fever, but of small pox, and the human system to be susceptible, not merely of *one*, but of *reiterated* attacks of it.

Of such a state of things, the consequence is evident. Commercial intercourse continuing, Europe and America, continental and insular, maritime and interior, would be as uniformly and perpetually the receptacles of *West India variolous contagion*, as they are now of *West India sugar and coffee*. In contravention of such an issue, human precaution would be ineffectual. (f)

X. Although incapable of generating the same complaint, can the contagion of yellow fever produce, in northern latitudes, any other destructive disease?

In showing that yellow fever is not contagious, this question has already been virtually and practically answered.

Admitting, however, that in the course of the fever, a specific poison *were* secreted, that substance, wherever transported, must produce the *same* disease, or *none*. Poison is the same, and man the same, in every region of the globe. Difference of climate, situation, and manner of living, can modify a complaint, but cannot radically alter its nature. Certain descriptions of men, beyond others, escape certain diseases; but, when attacked, their symptoms are those that belong to the distemper. Arsenic in Norway, and arsenic in Hayti, when acting on the human stomach, produces the same effect.

With some difference in violence and danger, the poisons of small pox, kine pox, and lues venerea, propagate their parent diseases throughout the world. So must the contagion of yellow fever, had it any where an existence. The fundamental law of creation is, *that every thing must act according to its nature*. Abolish this, and chaos is recalled.

As well, by change of climate, might a chesnut produce an oak, or an acorn, a fir tree, as the contagion of one disease, generate another. Somewhat to modify the productions of nature, belongs to created causes; completely to revolutionize them, to God alone.

XI. If the answer to question IX, being affirmative, admit that yellow fever may be translated to the climates.

of the north, and there prevail, if not epidemically, at least in a sporadic form,

a. What means should be adopted to prevent its introduction, especially if the contagion can be conveyed in merchandise brought from infected ports?

b. If the answer be negative, ought the institution of quarantine to be abolished?

Substantially, the first of these questions has been already answered.

Yellow fever not being transportable and communicable by contagion, no means annoying to commerce, and subversive of interest, ought to be employed to prevent its introduction into the north of Europe, *by infected goods, or diseased individuals.* Measures of this description being unequally oppressive, and *exclusively injurious, are absolutely wrong.* Mistaken notions were their parent, and prejudice is their nurse. Science disowns them, and philanthropy has long deplored their existence. The interest of nations, and the honour of the nineteenth century, demand their abolition. That ruler who shall set the first example, in subverting them, will deserve, and receive, in the gratitude of posterity, a monument beyond gold in price, and adamant in duration.

Involving matters of vital importance to the welfare of man, the second question invites the most serious consideration.

Although yellow fever cannot be introduced into the north of Europe, *by infected merchandize, or distempered individuals,* the case is different with regard to *damaged cargoes and foul ships.* By means of these, other circumstances concurring with them, there is reason

to believe that, *sporadically* at least, it may be, and perhaps, has been, introduced

That the foul air of a ship, arising from a damaged cargo, or some other internal repository of filth, has generated malignant fever, *at sea*, cannot be doubted. For the production of febrile miasmata, such a vessel contains in her hold, or among her timbers, every thing requisite—heat, moisture, and perishable matter. The formation of such miasmata, then, and their consequent action, on the systems of those that are exposed to them, become inevitable. Even contagionists, who once denied them, are compelled, now, to receive these facts as conclusively established.

But exhalations that are deleterious in one place, cannot be expected to be harmless in another. If they produce fever at sea, they will scarcely fail, on the arrival of the vessel in port, to do the same thing on shore. Against their effects, therefore, as a source of disease, every precaution that is practicable should be adopted.

In the city of Philadelphia, (I still refer to that metropolis, because it was long the theatre of my observations,) the cause I am considering has been deeply calamitous. That many cases of yellow fever have been generated *there*, as well as in other ports, by cargoes of damaged coffee, Indian corn, limes, and other articles of a perishable nature, is now universally admitted, because, when formerly denied, it was satisfactorily proved.

In the years 1793, 1797, and 1805, the first cases of disease proceeded from sources of this description. For evidence of this, I might refer to the writings of Dr. Rush, and other publications which the occasions

produced. But, relying on personal observation, I assert the fact on my own responsibility. In investigating the subject, in the two latter years, I was actively concerned; and the evidence collected was abundant and satisfactory. Nor did I fail, at the time, to lay much of it before the public, in one or two dissertations, which are still extant.

Even in the northern and healthy port of Boston, in the summer of 1819, a memorable example of the same kind occurred. In almost every one that approached it, a cargo of Indian corn, in state of deep putrefaction, produced a disease exceedingly malignant, and, in most instances, fatal. Not less than thirty individuals became its victims. The character of the season not being congenial to it, the disease was fortunately but limited in its range. To extinguish it, the vessel was removed to a distance from the wharf where she had lain, and, if my memory be not fallacious, scuttled and sunk. Of the event, generally, I speak with confidence, because I was in Boston at the time of its occurrence.

But even when their cargoes had not been damaged, vessels have often given rise to fevers in port, by deleterious exhalations, emitted by filth deposited among their timbers. In the summer season, this event may happen in any climate, and arrangements to prevent it should every where exist.

Persuaded of the correctness of this view of the subject, I should deem it inexpedient and hazardous to abolish, in commercial seaports, all measures of defence against the introduction of disease, by foul ships and damaged goods.

Let their institutions protective of health, then, be

maintained, and their regulations to that effect, rigorously executed. But, let their object be, the exclusion of *filth* and *deleterious miasma*, which *do exist and produce disease*, not of *contagion*, of which *neither is true*. To this end, let their means of defence be directed against *impure vessels and putrid cargoes*, not against *infected goods and distempered individuals*. Their antagonist, then, like a real substance, will be tangible and confined to some place, not like a phantom, to the superstitious and the timid, every where suspected, and no where to be found.

Under this system, I repeat, *Quarantine*, in the strict interpretation of the term, will be abolished. We shall hear no more of keeping vessels *forty days* at anchor, to free them from contagion, by the magic of *numbers*. The measures pursued will be no longer derived from the cloistered superstition of the dark ages, but dictated and approved, by the experience and philosophy of the present age.

Conformably to this, diseased individuals will be immediately received, under proper regulations, into suitable hospitals, those that are healthy, instead of being detained on ship-board, until, by confinement, chagrin, and want of exercise, they contract sickness, will be suffered to go on shore, without restraint, all undamaged goods will be landed, being first, if deemed expedient, carefully ventilated, such as are damaged will be removed, purified, or destroyed, and the vessel will undergo a thorough lustration.

In common cases, all this may be effected in *five days*, as perfectly as in *forty*. I speak from experience, having been myself a member of a Board of Health, and

engaged in directing and enforcing what I now recommend. Had not my opinions been sanctioned by practice, I would not have written on the present occasion.

He that conscientiously prepares himself to deal out practical instruction, must do it by the acquisition of experimental knowledge. Book-learning and closet-reflections will enable him to *theorize*, but experience alone can qualify him either to *act* or *direct*.

By a Board of Health, sufficiently vigilant, even *healthy* vessels from *healthy* ports, will be carefully examined, during the summer season. If they be leaky, or freighted with hides or fruit, coffee or grain, especially in bulk, or other articles liable to putrefaction, sickness may be produced by admitting them into port, and emptying their holds, or opening their hatches. In such a case, let them be inspected by competent officers, and, if discovered to be foul, measures of purification should be rigidly enforced. By this procedure, their pent and concentrated miasmata will be dissipated or destroyed, and disease prevented, which might have been otherwise engendered. (g)

In a large and populous seaport, the only certain preventive of yellow fever, consists in *general and perfect cleanliness*. And *that*, if rigorously practised, it may be confidently asserted, will never fail.

But, to be effectual, it must extend, not merely to cargoes and vessels, but to docks, and wharves, and streets, and alleys, and every other repository of putrifying filth, which the city contains. Whatever can, in any degree, contaminate the atmosphere, it must correct or remove. Let it be thus comprehensive and complete, and, I repeat, that, as a measure of protection from yellow fever, it will be found sufficient.

But if, regardless of purity, and immersed in foul exhalations from a thousand sources, the officers of health busy themselves only about the prohibition and removal of goods and individuals suspected of contagion, their measures are unwise, and their exertions will be unavailing. Malignant fever *will* assail them, should a congenial constitution and season concur.

Whatever my mere *opinions* might have been, had I not witnessed very different results from different schemes for the preservation of the health of communities, according as they were directed against *contagion, or miasmata*, I would not have expressed myself so confidently on the subject. Nor would I have ventured so warmly to recommend the *latter*, had not experience convinced me of its superior usefulness.

A few observations on the *pathology* and general treatment of yellow fever, shall close this memoir.

The *immediate seat* of that disease is the internal coat of the stomach, the local affection extending, at times, to the duodenum, and perhaps further. But its foundation is laid in an *extensive congestion* of the *abdominal viscera*. From this congestion, not, perhaps, an organ within the range of the portal circle is entirely exempt. In different cases the liver has been found engorged in different degrees; at times but very slightly. When that organ has been discovered to be least affected, the congestion in some of the other abdominal viscera, particularly the stomach, has been the deeper.

The state of congestion generally, is also exceedingly different in different cases of the disease. It is *excitative, inflammatory, or of a degree, so high as to prostrate the system, and take from it entirely the power of reaction.*

As in all other complaints, congestion here is the product of antecedent *irritation*. That irritation, again, is but another name for a deleterious impression, effected through the property of *irritability*, by means of a specific aerial poison.

If, then, yellow fever consist in abdominal *congestion*, inflammatory or otherwise, the curative indication is to remove it, and equalize the broken circulation and excitement. Internal congestion is accompanied by an external deficiency of blood. To carry this indication into effect, different means must be employed, according as the congestion is more or less intense. With this intensity correspond the violence and danger of the complaint.

The modes of removing congestion are two, *depletion* and *revulsion*. Depletion is effected in two ways, *venesection*, and *secretion*. Revulsion is produced by *counter-irritation*. When the congestion is *internal* the counter-irritation is excited on the skin. When *external*, it is often removed by irritation in the stomach, skilfully directed.

Secretion, to be effectual, must be more or less general. But that form of secretion is most immediately useful, whose organ is nearest to the seat of congestion. In the observations about to be offered, on the treatment of the disease under consideration, the applicability of these remarks will be rendered apparent.

Yellow fever appears in *four several grades*, constituting so many varieties or forms of the disease.

In the *first* of these, it is a very mild complaint, and easily cured; much less obstinate, and not more dangerous, than a common case of tertian intermittent. The

stomach is retentive of the requisite medicinal substances, the febrile heat and other symptoms are not intense, the head is rarely affected with severe pain, the intellect although debilitated is never deranged, the constipation of the bowels is seldom troublesome, and the discharges from them are always accompanied with a show of bile. The only truly distressing symptom is, a feeling of weakness and prostration, greatly beyond the seeming amount of disease. When, in a recumbent posture, the patient is comfortable, and fancies himself nearly well. But an effort to walk, stand, or even sit, convinces him of his error. The complaint continues from five to seven days.

The treatment of this form of the disease is exceedingly simple. It consists in a recumbent posture, perfect quietude of body and mind, diluting drinks, a mild vegetable farinaceous diet in very small quantities, and, perhaps, a few doses of calomel to promote hepatic, gastric, and intestinal secretion.

This variety of the complaint is never fatal; nor is blood-letting, puking or blistering, necessary in the cure of it. Such is its uniform mildness, that many practitioners who are ignorant of the laws and characters of epidemics, are unwilling to denominate it a form of yellow fever. But, to the eye of the scientific and experienced physician, it stands confessed a modification of that complaint.

The second variety of this disease is more severe; but, under the influence of early and skilful treatment, it also is free from danger.

The stomach here is more irritable than in the variety just considered, the epigastric region is slightly painful on

sustaining pressure, the febrile excitement is higher, the skin dryer, the urine scantier and more highly coloured, the head-ache more troublesome, the intellect more affected, yet not often deranged, the countenance flushed, and the eye somewhat suffused and watery. Add to this, severe thirst, the tongue considerably furred, a constipated state of the bowels, and a secretion of bile defective and vitiated. Every symptom clearly indicates stronger centripetal action, and a deeper congestion of the abdominal viscera.

In this form of the complaint, the treatment must be more energetic than in the last. The congestion here, although not strictly *inflammatory*, is highly *excitive*. *Secretion* and *revulsion* are both required; yet the action of the system is above the *secretive* and *revulsive poin's*.

By the antiphlogistic treatment must this inordinate action be reduced. A recumbent posture and perfect tranquility must be enjoined, venesection practised to the requisite extent, cool diluting drinks administered, and the surface of the body repeatedly spunged with cold water.

The excitement of the system being, by these means, sufficiently reduced, let appropriate secretory remedies be administered. These consist in calomel alone, or united with tartar emetic, in such proportions, as to produce, at once, both vomiting and purging. A moderate *cholera morbus* thus excited, is often productive of the most salutary effects. If it does not considerably shorten the course of the complaint, it, at least, very greatly detracts from its violence and danger. By the gastric, hepatic, pancreatic, and intestinal secretion which it excites, it tends *immediately* to the diminution

and removal of abdominal congestion. And to the same end it contributes more *remotely*, by awakening the secretory action of the skin. No sooner does the bile begin to flow in liberal quantity, than the surface becomes soft, its temperature abates, and a free perspiration makes its appearance. In the mean time, the tongue becomes moister and cleaner, and the urine, if it does not increase in quantity, changes its character, and begins to deposit somewhat of a sediment. Continue these secretions, for the requisite period, by administering, from time to time, suitable doses of calomel and tartar emetic, and the case cannot fail to terminate favourably.

If, as may be sometimes the case, there exist any reason why tartar emetic should not be exhibited along with calomel, ipecacuanha may be made its substitute.

Another mode of practice which often proves successful, is, to administer the calomel alone, and follow it, in from one to two hours, with moderate doses of tartar emetic, dissolved in water, until the bile and other secretions begin to appear. For, let it be always remembered, that the prime object in view is the excitement of secretion. Nor ought it to be forgotten, that, to act on the liver and procure bile, tartar emetic is one of the most certain and powerful of remedies.

In other cases, the exhibition of calomel, with the subsequent employment, within a few hours, of an infusion of senna, or a solution of sulphate of magnesia has excited secretion and subdued the disease.

In this form of the complaint, provided medical aid be opportunely employed, neither blistering, nor salivation is ever found necessary. Nor is yellowness of the

skin either a frequent occurrence in it, or deep, when it does occur.

The third grade of yellow fever is violent and dangerous in the highest degree. Under the most skilful and vigorous treatment, *many* die of it; and, without such treatment, but *few* recover. That abdominal congestion in it is intense and inflammatory, and very strongly determined to the stomach, post-mortem examination, as well as all existing symptoms, conclusively testify.

The symptoms which more particularly give evidence to this effect, are, an extreme irritability of the stomach, manifested by an immediate rejection of every thing swallowed, a sense of fulness, tension, and burning in that organ, an exquisite sensibility and soreness of the epigastric region to the touch, and sometimes a fulness and tenderness of the whole abdomen. So acutely sensitive, in some instances, is the region of the stomach, that the weight of the bed-clothes gives intolerable pain.

To these symptoms may be added, great anxiety and restlessness, high febrile excitement, as evidenced by an augmented temperature, a tense, contracted, hard, quick, and frequent pulse, and a degree of fiery and distressing thirst, that nothing can extinguish. To these add, a violent throbbing in the carotid and temporal arteries, a flushed countenance, a muddy, red and watery eye, high delirium, and an entire inability to sleep, or unrefreshing sleep, frequently interrupted by sudden startings and frightful dreams. The constipation of the bowels is obstinate, and if, in such partial evacuations as can be procured, any bile appear, it is defective in

quantity and deeply vitiated. In very many cases, no bile is secreted. The same thing is true, at times, in relation to the urine. The secretory action of the kidneys is entirely suspended, constituting one of the most fatal symptoms of the disease. A single recovery where it occurred, the writer of this memoir has never witnessed. It is to this form of the disease that a *yellow skin* and genuine *black vomit* peculiarly belong. The prostration of strength in it is not so great, as it is in the lighter forms of the complaint. So true is this, that the patient often leaves his bed, and moves about his chamber, as if he were but slightly indisposed.

In this, as in every other grade of fever, the object of the practitioner is to produce secretion. But the degree of excitement is greatly above the secreting point. The first remediate effort, therefore, is to reduce it. To effect this, the treatment must be strictly and vigorously antiphlogistic.

Quietude must be perfect, irritants of every description must be removed, blood must be liberally drawn, not *by measure*, but *for effect*, cool, acidulated, diluting drinks must be given in such quantities as the stomach can, without inconvenience, retain, the surface of the body must be repeatedly sponged with cold water, so that the temperature may be preserved, as near as practicable, at the standard of health, and efforts must be made to evacuate the bowels by means of injections. But, in the early stage of the complaint, even the injections ought not be very irritating.

Should the irritability and convulsive action of the stomach continue, so that every thing received into that

organ is immediately rejected, leeches or cupping glasses may be advantageously applied to the epigastric region, so as to unite to those of *general*, the effects of *topical*, bloodletting. But let the *general* excitement of the system be previously subdued, else the *local* evacuation will prove unavailing. If, by these remedies, the irritability of the stomach be not removed, a large blistering plaster may be advantageously applied over the whole of the epigastric region, while, to the inside of the wrists, a similar application is made, at times, with a similar result.

The stomach being tranquilized by the reduction of its irritability, and the general excitement being brought down to the secreting point, secretory remedies are now to be administered. Of these, calomel is to be chiefly relied on, as being best suited to the production of the gastric, hepatic and intestinal secretions, which are again best calculated for the removal of *portal* congestion. After the exhibition of a few suitable doses of calomel—and oftentimes *full* doses irritate much less than *small* ones—let some more active purgative be administered, to awaken the peristaltic motion of the bowels. For this purpose, jalap, epsom salts, soluble tartar, and an infusion of senna, have all, at times, been advantageously used. The practitioner may select either of them, at pleasure, or such other purgative, as he may deem most suitable to the peculiar exigency and condition of his patient.

If, by this process, bilious evacuations can be copiously procured, even although of a vitiated character, the prognosis is favourable. The patient *may*, and probably *will*, recover; because the abdominal conges-

tion is likely to be removed. And, synchronously with the liver, the other secreting organs begin to act. The skin becomes soft and moist, the urine flows in larger quantities, and of a more favourable appearance, the tongue becomes less parched and cleaner, and even the bronchial mucus is more abundant. Every thing indicates that centrifugal action begins to predominate.

But if the biliary secretion cannot be excited, the prospect is unpromising, and the danger great. Unless the diseased condition of the system, particularly of the abdominal viscera, be speedily changed, the derangement of the stomach will be augmented, black vomit must ensue, and the patient will die.

In this conjuncture of difficulty and peril, the practitioner's reliance, and the patient's hope, rest on the steady and persevering use of calomel, in moderate but frequently repeated doses, until an incipient ptyalism indicates that the mercury has produced its constitutional effect.

As a general rule, no sooner has the *saliva* begun to flow, than the bile also appears, and the urine and perspiratory discharge become more copious. Maintain, for a time, this state of things, and the patient will recover.

In this form of yellow fever, where the irritability of the stomach is so inordinate, neither tartar emetic nor ipecacuanha ought to be given without great caution. When imprudently administered, in an early stage of the disease, previously to the employment of depletion by the lancet, and while gastric inflammation continued intense, the mischief effected by them has been too often irreparable. They have produced a puking

which nothing could allay, until its termination in real *black vomit* and death.

But after gastric irritability has been sufficiently appeased, by the remedies already indicated, and when calomel is retained in moderate doses, repeated every hour or two, small quantities of tartar emetic, dissolved in water, may be given in the intervals between the doses of calomel, with great advantage. When thus administered, that important remedy aids, not a little, the mercurial preparation, in awakening the secretory action of the stomach and liver; while, at the same time, it promotes secretion by the skin, and augments materially the bronchial discharges. Skilfully directed, ipecacuanha may, in some cases, be made to contribute to the same ends. So may opium, united with these articles, by deadening irritability, and rendering the stomach more certainly retentive of them.

Such, in the treatment of this form of yellow fever, are the modes of employing the heroic remedies, in which the confidence of the practitioner is to be chiefly reposed.

Should it become requisite, on account of the state of the complaint, to have recourse to rubefacients, sinapisms, blisters, and internal stimulants, the use of them must be directed by the same rules, which govern their administration in other diseases. The ends to be attained by them are, to sustain action, and produce revulsion. And, for these purposes, when requisite, they should be vigorously employed.

Fortunately for man, yellow fever but rarely assumes the unsightly garb and fearful character of its fourth and highest grade. For, when it does, as far as the ex-

perience and observation of the author have extended; it is *always fatal*.

In this modification of the complaint, all the powers of the system are prostrated, from its commencement, far below the point of reaction.

The cerebral and nervous energies are extinct. Hence the countenance is dull, vacant, and sepulchral, the intellect frozen and fatuous, and the voluntary powers most alarmingly debilitated. The skin is of a dusky marbled, or a mahogany colour, somewhat smooth to the touch, and cadaverously cold. The pulse, if at all perceptible, is exceedingly feeble, slow, and irregular. The slightest pressure on the artery stops entirely the lazy current that lags within it.

The stomach and bowels are either entirely torpid and inactive, or discharge, at intervals, without any seeming conscious effort, on the part of the patient, a peculiar fluid, dark and flaky in appearance, and of an odour nauseously offensive.

Corresponding with the condition of every other function, respiration is extremely feeble and imperfect. The *temperature* of the air expired, differs but little from that of the air inspired. In the language commonly applied to such cases, "*the breath is cold*." The process of the *arterialization* and consequently the *vitalization*, of the blood, is either *extinct*, or performed in a degree that is fatally *defective*. Hence the livid or modena colour of the lips, nails, the skin immediately under the eyes, and the petechiæ or vibices which make their appearance on various parts of the body. And hence the alarming want of *vitality*, in all the organs of

the system, which can be received only from *arterialized blood*. Suspend, or deeply deteriorate, in any way, the vitalizing action of the lungs on the blood, that fluid becomes *venous*, and the system fails in its living energies. To this effect, evidence is abundantly derived from the condition of those unfortunate individuals, denominated, in common language, "*blue boys*," in whom, the foramen ovale, and the ductus arteriosus remaining open, but a moiety or perhaps much less of their blood passes through the lungs, to receive the arterializing influence of that organ. The *complexion* of these subjects is known to be *livid*, and their *debility great*. In the defective condition of all their functions, their incapacity to sustain labour without unusual fatigue, and the general debility of their systems, their want of the customary amount of vitality is conclusively manifested.

In the dismal form of the disease under consideration, the entire *action* of the system, as far as any may be said to exist, is *centripetal*. Hence all *secretory* action is suspended, not excepting that of the *kidneys*, which, as already stated, constitutes one of the deadliest symptoms. As the complaint usually terminates fatally in less than twenty-four hours, and not unfrequently in from *ten* to *twelve*, or even in a period still shorter, no yellowness of the skin is produced. On this account, superficial observers and puny philosophers, have often denied it to be yellow fever. It is thus that by far the most malignant cases of *true plague* are frequently denied by similar characters to belong to that disease, because they terminate fatally in a *few hours*, without the formation of *bubos* or *carbuncles*.

But the production of both *bubos* and *carbuncles*

in plague, and of a yellow skin in yellow fever, indicates the existence of no inconsiderable degree of vital action; and that action of a *centrifugal* character. In the *form* of those diseases, however, which is now under consideration, such action does not exist. The complaint is too malignant, and too much confined in its ravages to *internal* and more *vital* organs, to give rise to any affection of the *skin*. *Primitively* and *sympathetically*, it assails more particularly, with its deadliest poison, the stomach and abdominal viscera generally, the nerves, the brain, the lungs, and the heart. Its attack is as sudden as that of apoplexy. The patient sinks almost motionless, under the paralysing force of the deleterious impression which the poison produces.

In relation to the treatment of *this form* of yellow fever, the author of this memoir has but little to remark. His object has been, to communicate to the public *his own experience*. But, unfortunately, his experience has taught him only the fatality of the complaint, and the insufficiency of every mode of practice he has hitherto employed. For, he repeats, that every case of this *ultimate grade* of the disease, that he has witnessed, has terminated in death.

He certainly has in reserve a scheme of treatment which he has never yet practised in this terrible complaint; but which he has resolved to practise, should an opportunity at any time hereafter occur. But as this scheme is not sanctioned by his experience, he deems it premature and improper to recommend it.

He will only observe, that, in this, as in every other form of yellow fever, the ultimate object of the pra-

titioner should be, to excite *secretion*. But the action of the system is far *below the secreting point*. The first step, therefore, is to raise it to that point—in other words, to rouse the system to reaction, and produce, if possible, *febrile excitement*. To effect this, the most powerful stimulants, both external and internal, should be abundantly, skilfully, and perseveringly applied. But, as the mass of blood is too weighty for the action of the enfeebled heart to maintain in motion, to diminish and lighten that mass, by means of venesection, cautiously employed, (*h*) in the midst of the use of awaking and strengthening stimulants, is a mode of treatment which the perilous nature of the complaint justifies, which reason and analogy seem to approve, and which no established principle forbids. Although the author does not recommend this practice to others, he would not hesitate, under a pressing emergency, to pursue it himself, with such precautions as circumstances might suggest. Many a vessel, likely to founder in a troubled sea, has been eventually saved, by throwing overboard a part of her cargo, and spreading more canvass to force her through the waves. In the present case, the *blood* is the *cargo*, the *stimulants*, the *sails*.

If, by the means here suggested, reaction and febrile excitement can be awakened, the patient *may* be saved. The next step will be, to produce abdominal and general *secretion*, together with the requisite *revulsion*, by the medicinal articles recommended for these purposes, when the cure of the third form of this disease was under discussion.

As far as the author may rely on his own experience, he is perfectly persuaded, that convalescence, from eve-

ry form of yellow fever, is best conducted without the use of *medicinal tonics*. If congestion be completely removed, those articles are *unnecessary*; and if it be not removed, they are *injurious*.

The most safe and efficacious course of tonics consists in the proper regulation of what is fancifully termed the *non-naturals*, which consist of, air; aliment; exercise and rest; passions and affections of the mind; wakefulness and sleep; repletion and evacuation.

A skilful administration of these agents, aided by a judicious regulation of the article of dress, will rarely fail to prevent relapse, and render the march of convalescence secure and rapid.

END OF MEMOIR II.

NOTES TO MEMOIR II.

Note (a) page 89.

By the term putrefaction, as used in this Dissertation, I mean, that natural process of decomposition and re-composition, which dead organic matter sustains, when under the influence of heat, moisture, and atmospheric air.

Note (b) page 94.

When the *Oriflamme* sailed from Siam, the *port* and the *ship* were both *healthy*. Nor was the health of her crew affected when she arrived at Martinique. But soon after her arrival, a malignant fever made its appearance in the vicinity of the place where she lay; and some of her crew were among the first subjects of it. Hence the introduction of the complaint was attributed to her.

Such were the facts. Their explanation appears equally simple and plain.

Either the *Oriflamme*, in the course of a long voyage, had become foul; and, when undergoing a cleansing in dock, with her ports and hatches all open, sent forth a deleterious gas, which engendered disease; or she arrived at Martinique, just as an epidemic was about to commence, and, *very naturally*, some of her crew, being *strangers in the place*, were among the first who sickened. Most probably both these circumstances existed, and united their influence in effectuating the result.

Note (c) page 112.

In Philadelphia, the yellow fever of 1798, was preceded by a considerable spread of small pox.

When the former disease appeared, and assumed an epidemic form, the latter became more malignant and fatal, and was marked, in many cases, by genuine black vomit. It yielded, at length, completely to the predominancy of the epidemic, and entirely disappeared, long before the termination of that complaint.

Note (d) page 124.

The sudden cessation of the plague of the Nile, at a given period, is ascribed, by the natives, to supernatural agency, and homage is paid, in gratitude for it, to the tutelary Divinity, or Saint, of the place.

Note (e) page 133.

In the year 1805, yellow fever appeared first in Southwark, one of the suburbs of Philadelphia, in the vicinity of a very large pile of oyster shells and damaged oysters, that sent forth an odour peculiarly offensive.

For some weeks previously to the occurrence of the disease, many dogs, in the neighborhood of this mass of putrefying matter, sickened, and several of them died. Their complaint was *intestinal*, as appeared from their symptoms while living, as well as from an examination of their bodies after death.

Note (f) page 146.

Similar remark smay be applied, with equal propriety and force, to *pestis vera*, or oriental plague.

Were that disease capable of being propagated by contagion, and were commercial intercourse with the countries where it prevails regularly and constantly maintained, as it is at present, all the quarantine establishments that man could erect and administer, could not exclude it from the seaports of Europe. And were it in the seaports, it would reach the interior, and Europe *entre* would be the theatre of its ravages.

Nor would the evil terminate here. From the old world it would inevitably pass into the new, until finally, *its limits* would be the same with *those of the inter-*

course of nations with each other. Its range would be the same, and its *perpetuity* the same with those of small pox.

Admitting it to be contagious, it is impossible to render a substantial reason why it should not spread as extensively, and prevail as constantly as small pox, or any other contagious malady.

But pestis vera is not propagated by contagion. In attempting to prove that it is, Russell, the great apostle of that doctrine, has virtually and satisfactorily proved the reverse. It originates from the same causes that engender yellow fever—temperature, humidity, dead organic matter, and a favoring constitution of the atmosphere. It is yellow fever, modified by climate, situation, and a few other circumstances.

Sentiments to this effect I publickly uttered in the year 1801, in an oration, “on the *analogies* between yellow fever and true plague,” delivered to the Philadelphia Medical Society, and published by that body; and all the additional information I have since been able to acquire on the subject, has tended only to convince me that they are true. The following extract is from that production.

“But epidemic plague and yellow fever resemble each other in their decline and termination, no less than they do in their rise and progress.

Having raged with more or less violence throughout the summer and autumnal months, the career of both is immediately closed on the accession of cold weather. So completely are their semina blasted by a moderate frost, that, after such an occurrence, there remains in general no shadow of ground to dread their influence. It is indeed true, that sporadic cases of these diseases appear even in the depth of winter: but they are the offspring of causes which operate only on a circumscribed scale. It belongs to spring, summer, and autumn, particularly to the two latter seasons, to render the plague and yellow fever epidemic. The reason of this

is obvious. It is during these seasons only, that a sufficiency of putrid exhalation can be evolved, to impregnate the atmosphere to the pestilential point.

To the foregoing account of the termination of plague, I am not ignorant that there exists an exception. Instead of continuing till the commencement of winter, this disease, in Egypt and Syria, terminates uniformly about the summer solstice. Hence it has become proverbial, that extremes of heat and cold are alike destructive to pestilential contagion.

Does not this circumstance, it may be asked, constitute an essential difference between plague and yellow fever? I answer, it does not. For did the latter disease visit the above mentioned countries, it would terminate at the same season with the former.

However paradoxical it may appear, it is unquestionably true, that in Syria and Egypt, plague expires during the heats of summer, on the same principle, which, in European countries, leads to its termination on the commencement of winter. The cause, in both cases, is a failure of the food of putrid exhalation. For, as already observed, plague and yellow fever prevail only at such times and in such places, as are favorable to the production of this gaseous poison.

In most parts of Asia and Africa the climates are materially different from those of corresponding latitudes in Europe and America. This difference is in a great measure attributable to the burning deserts of the East, which, by communicating their temperature to the surrounding countries, render them much warmer than others remote from such torrid regions. But epidemic diseases are known to be greatly under the control of the temperature of the atmosphere. We must therefore expect, that the epidemics of countries so dissimilar in their climates as those just mentioned, will not only be somewhat different in appearance, but will rise and terminate at different seasons of the year.

Syria and Egypt may both be considered as southern

regions, subject no less to extremely dry, than to intensely hot weather. In the former country no rain falls from the middle of May until the middle of September, while the latter suffers a drought of a much longer continuance. Nor has nature been more liberal in supplying them with terrestrial streams, than she is in refreshing them with the waters of Heaven. Syria contains no river of note but the Orontes, and the Nile is the only one that waters the land of the Pharaohs. The existence of smaller streams is rendered impracticable, partly by the scanty falls of rain, and partly by the thirsty nature of the soil.

In consequence of this deficiency of moisture, co-operating with the extreme heat of their climates, these places, throughout the summer months, exhibit the most parched and dreary aspect. During this inclement season, so completely suspended are the powers of vegetation, and so dead and withered the foliage of most plants, that both countries appear as if scorched by fire. Exhausted of their waters, to the last drop, even the air and the earth contribute to heighten the general aridity. Under such circumstances, putrefaction, no longer able to go forward for want of humidity, ceases to impregnate the atmosphere with deleterious effluvia. For, to the existence of this process, moisture is no less necessary, than it is to preserve the verdure, or to promote the growth of the tenderest vegetable.

No sooner have the heat and drought of the season produced in every thing such an excess of dryness, which happens about the 20th or 24th of June; no sooner has the atmosphere become thus depurated of putrid exhalation, than the ravages of the plague, which had been kept up by the putrefaction of the vernal months, are immediately at an end, as if staid by the influence of supernatural agency. Deprived of its proper aliment, in consequence of this deficiency of water, the monster may be said to perish by famine. Were Syria and Egypt supplied with uniform rains, like the coun-

tries of Europe, there is no doubt but summer and autumn would be their principal period of suffering from this disease. After the autumnal rains of Syria, there is not a sufficiency of heat, previously to the commencement of winter, to generate afresh the seeds of pestilence.

We may lay it down, then, as a physical axiom, that the destruction of putrid exhalation, whether effected by the frost of winter, or by the co-operation of heat and drought, will arrest the desolating progress of plague. But the same thing is true with regard to yellow fever, which depends for its origin and propagation on the same efflavia. In this particular, therefore, no less than in others already mentioned, these two diseases exhibit a striking affinity.

I am not ignorant that several writers of note, have ascribed the cessation of the Egyptian plague to a different cause, namely, the *superflux* of the Nile, which they allege purifies the air, either by drowning, or washing from the neighboring country, all existing sources of putrefaction. But a reference to dates will immediately convince you that these authors are mistaken.

The Nile begins to swell about the seventeenth of June, rises at the rate of four inches a day, and does not overflow its banks until the middle of August. But the plague ceases uniformly about the twenty-fourth of June. How then is it possible, that the waters of this river, which do not begin to inundate the country for nearly two months afterwards, can, at this period, either overwhelm or wash away the filth of its surface?

Were the face of Egypt covered with water, at the time when the Nile is in reality only beginning to swell, I would be disposed to attribute the ceasing of the plague to this inundation. For an excess is no less imimical than a deficiency of water to the putrefactive process. But, as every cause must necessarily precede its effect, it is unphilosophical, not to say absurd, to ascribe the cessation of the plague of Cairo, on the twen-

ty-fourth of June, to the overflowing of the Nile about the middle of August. Although the superflux of this river is the saviour of Egypt from depopulation by famine, it does not appear, from our latest and best accounts of that country, to have any particular influence on the health of its inhabitants.

Those persons acquainted with my infidelity respecting the contagion of yellow fever, will, no doubt, suppose me at a loss to discover, on that score, any analogy between this disease and the pestilence of the East.

On this subject it becomes me to speak with diffidence and caution, because I am unable to speak from observation. To the writings and conversation of others am I indebted for the principal part of what knowledge I possess, relative to the nature of true plague. But from all I have been able to collect, through these channels, I find no solid ground of belief, that this disease is really contagious. On the other hand, the further I pursue the inquiry, the more am I inclined to consider it as propagated, *not by contagion, but solely through the medium of a vitiated atmosphere.*

My principal reasons for this opinion I will endeavour to lay before you in a few words.

I. Plague prevails only under certain constitutions of the atmosphere, which medical writers denominate pestilential, and during those seasons of the year, which favour the generation of putrid exhalations. Two circumstances therefore seem essential to its existence and propagation, an atmosphere radically malignant, rendered still more so by the admixture of deleterious gases. On the aid of these two adventitious causes it is as dependent, for its prevalence, as combustion is on that of vital air.

But, how different is the case with small pox, lues venerea, and other truly contagious diseases? Possessed of an inherent and independent power of self-propagation, these maladies prevail and spread at all seasons of the year, and under every varying constitution of at-

mosphere. To their communication from the sick to the well, foul air is no more necessary, than it is for the spreading of flame from one combustible body to another.

II. When plague is epidemic in a town or city, and cases of it are removed to healthy situations, in the surrounding country, or to neighboring towns and villages free from disease, it is not communicated to the nurses or attendants of the sick. This fact is amply attested, and seems to declare, in the most explicit terms, that the disease in question is not possessed of any specific contagion, or inherent power of self-propagation, but is altogether the creature of adventitious causes. Under similar circumstances, how different are the phenomena exhibited by small pox? Like an electron per se, this disease, by means of an infectious power, of which nothing can deprive it, propagates itself alike in every situation.

III. The sudden and entire cessation of plague, in Syria and Egypt, about the summer solstice, and in Constantinople on the accession of cold weather, is inimical to a belief in its contagious nature. Immediately after its termination in those places, (which is sometimes almost instantaneous, and where a belief in the doctrine of fatality prevents every measure for the removal or destruction of contagion,) the apparel of the dead is worn by their surviving connections, their beds are slept on, and their furniture in general used and handled in the most familiar manner. Nor is this all: Even the low filthy hovels, which had been utterly depopulated by the disease, are, without purification, presently filled up again by fresh inhabitants. Yet, from all this intercourse, apparently so inconsiderate and dangerous, no inconvenience whatever is experienced. Instead of immediately sweeping off those, who thus plunge into the midst of its supposed fomites, the disease is heard of no more, until the return of the next season of exhalation, or perhaps until a much more distant period, and then appears again without be-

ing attributable to any cause, except the existing state of the atmosphere.

Under the foregoing circumstances, plague ceases at the very time when its supposed *matter of contagion* would seem to exist in the greatest abundance, and when things would consequently appear to be in the best state of preparation for the continuance of its ravages. But if this disease cannot be *continued in action*, by such an *immense volume* of fresh contagious matter, issuing immediately from the bodies of many thousand sick and dead, how can it be *called into being again*, some time afterwards, by *an inconsiderable quantity* of the same contagion, (now perhaps grown stale with age,) adhering to a bale of goods, a chest of clothes, or even a single article of wearing apparel? As well might we attribute to a solitary and fading spark, a power of producing and propagating flame, superior to that possessed by an extensive and vigorous conflagration, as to allege, that from a small and weakened portion of contagion, a disease may originate, which an incalculable quantity of the same contagion, in the most active state, was unable even to preserve in existence."

Respecting the contagion of plague, rational investigation is beginning to be instituted. Nor will it be fruitless in its result. On the contrary, science, humanity, and national interest, will be equally benefitted by it. It will dissipate one of the rankest of superstitions, which, commencing in the cloistered ignorance of the dark ages, has continued to the present period, the terror and scourge of man, and the disgrace of medicine. It will clearly demonstrate, that the pestilence of the east and that of the west are the same disease—that they are both the product of a *malaria*, arising from the dissolution of organic matter, and that neither of them can be propagated from country to country, in an epidemic form, by commercial intercourse.

The result of the inquiries which are now in operation will be, an entire change in the objects of quarant-

tine establishments, whether they be erected against yellow fever, or oriental plague. Instead of sickly crews and *infected merchandise*, health officers will then look for *soul ships* and *damaged cargoes*. Perfect cleanliness will be the end at which they will aim.

Under this ameliorated condition of things, *reason* will ascend the throne which *superstition* had usurped, and the notions and stories of *pestilential contagion* will be classed and forgotten with those of *ghosts wrapt in winding sheets*, and *witches sailing in egg-shells*.

Nor is the notion of the contagious nature of typhus fever, scarlatina, hooping-cough, or dysentery, any better founded. These are all atmospherical diseases, arising either from a general *morbific constitution* of the atmosphere, or a *vitiation* of it from *local causes*. That none of these complaints are contagious, the writer of this memoir has long contended. Nor does he recollect, at present, any thing to the contrary, but that, for many years, he contended *alone*. In *numbers*, the odds against him were certainly very fearful. But he has the gratification to learn, that, of late, the doctrine of *non-contagion*, on a liberal scale, is advocated, by some of the ablest pathologists of the day.

That the author has long entertained *doubts* of the contagion of *measles*, is well known to those who have attended his lectures. But more of this on some future occasion.

Note (g) page 152.

The only means I have ever found it necessary to employ in the purification of vessels, are *water, soap, lime, and ventilation*. If applied judiciously, and to the proper extent, these can be confidently recommended as sufficient.

In the efficacy of the various fumigations, respecting which report has been so favourable and loud, my confidence is limited. That they are calculated to *neutralize* the poison of yellow fever, I do not know; and that they can effectually expel it from the holds, or from among the timbers, of vessels, I do not believe.

Note (h) page 166.

When venesection is practised in this form of the disease, let the physician keep his finger on the pulse, while the blood is flowing.

If the circulation be enfeebled by the loss of blood, let the orifice in the vein be immediately closed. But if it become more free and vigorous, let the process go on, until the effect desired is produced.

Although the circulation may be *weakened* by the first attempt to draw blood, it does not necessarily follow that it may not be *strengthened* by a subsequent one.

After the practitioner, therefore, shall have closed the orifice, and vigorously applied his stimulating agents some time longer, he may again try the effect of a further abstraction of blood, and govern his future proceedings by the result.

MEMOIR III.

THOUGHTS ON THE ANALOGIES OF DISEASE.

The *phenomena*, whether they be *objects* or *events*, which present themselves in the several departments of *creation* around us, and on which we bestow the denomination of *facts*, with the relations which they bear to each other, and to *the whole*, constitute the true foundation of science. Remove, subvert, or in any way derange them, and what we *now* call *science* would have no longer an existence. Should any thing deserving that name still exist, it would be altogether different from that on which we bestow the appellation at present. For science is nothing but a knowledge of facts and their mutual relations; general principles being the result of such relations.

Yet the amount of useful knowledge which different inquirers possess, and the degree of instruction they impart, in the communication of it, is not in proportion to the number of *facts* they have accumulated, and can respectively detail. Many individuals, opulent in their stores of these *elementary ingredients*, are deficient in the *principles* of science, because they are wanting in the powers that can alone construct them. They are qualified to observe and amass facts; but they cannot compare, judge, classify, and generalize them; they can-

not arrange and unite them into those chains called *principles*, because their relations and affinities are not perceived by them. Characters of this description, dealing too much in details, and dwelling on *detached parts*, instead of attempting to unite them into a *whole*, can never become distinguished either as writers or teachers. The reason is, that their intellect, sufficiently powerful in some of its inferior faculties, is feeble in those that are more elevated and important.

Others again, on whom nature has bestowed an intellect of a different and much higher order, abound in principles, while their store of facts is comparatively limited. Their chief powers lie in their *reflective* faculties, and their favourite employment consists in generalization and induction. All their facts they construct into principles, their raw materials of knowledge they so digest and assimilate to their own intellects, as to impart to all their attainments the matured and regulated character of science. Individuals of this description are capable of distinction both as writers and teachers. They, in the true interpretation of the term, may be denominated *philosophers*, while those who, without forming principles, have only collected facts—no matter how extensive and multifarious their collections may be—are nothing more than *men of information*. The latter want the power of comparing, judging, combining and inferring. The former possess it in an eminent degree.

In contemplating nature as she discloses herself to his view, it is the constant aim of the philosopher to compare with each other her diversified phenomena, and thus classify and generalize them, to as great an extent

as his collection of them will justify. In this way only can he maintain his standing in the community of science. To decline classification and generalization altogether, falls as far short of the spirit of philosophy, as an attempt to generalize beyond facts, is a perversion and abuse of it. Either practice is faulty, in its relation to science, although not perhaps exactly in the same degree. The one fails, from intellectual feebleness, or indolence, *in the establishment of truth*, the other, from an exorbitant love of hypothesis, *contributes at times, to the propagation of error*. The former arises from a defect of intellect, which no time is likely to remedy, the latter, from a description of mental exuberance, which, being more particularly characteristic of youth, is usually corrected by experience and years. An attempt to fathom transcendentalism rarely belongs to the maturity of age. The two states of intellect here alluded to, bear to each other somewhat of the mutual relation of idiotism and madness. The one consists in a *want* of powers which nothing can supply, the other, in a deep *derangement* of powers which *may* be restored.

The individual who acquires knowledge for no other than colloquial and common purposes, or merely with a view to his own amusement, is rarely solicitous about the establishment of principles. Nor is it important that he *should* be; because the end at which he aims can be attained without them.

The object of conversation, whose chief charm and excellency are its simplicity, sprightliness, variety and ease, is as much to amuse and refresh the intellect, during its relaxation from severer exercises, as to instruct.

or strengthen it. To be suited, therefore, to this purpose, its topics must be comparatively light and easily handled. Hence, even among the scientific and the erudite, it is not the custom, nor would it be held either expedient or decorous, to clog its course, or render it laborious or monotonous, by frequent and studied efforts to establish or inculcate general principles, or abstruse propositions.

To prove at once a source of rational enjoyment, and real usefulness, and to answer, in all respects, the ends for which it is intended, conversation must hold, both in matter and manner, a middle rank between empty prattle and formal harangue. When it degenerates into the former, it becomes frivolous and degrading, and it proves uninviting, if not offensive, when it swells to the latter. In the one case, it is disgraced by a want of intellect, in the other, it fails in interest and attractiveness, from an equal want of judgment and taste.

But, very different is the object of an effort to instruct in science, whether it be that of a public or private teacher, in the form of lectures, or of a writer, by means of a production from the press. In either case, the end in view is, not to dwell on *insulated facts*, which the pupils and readers might themselves collect without difficulty, but, from a judicious and comprehensive classification of facts, to inculcate principles, accompanied by so much of specification and detail, as may be requisite for the purposes of illustration and proof. The public teacher who does not thus proceed, will never prove a *useful*, nor require the reputation of an *able* instructor. On the contrary, he is either incompetent or unfaithful, in relation to his duties, and unworthy of

the elevated and highly responsible station he holds. His pupils may receive from him a certain amount of commonplace information; but, if they ever become men of *real science*, they must derive their improvement from some other source, and form themselves on some other model, than that of their preceptor.

If the chief intention entertained by pupils in studying a science, is to acquire a knowledge of the *principles* of it, (and no instructor need attempt to impart more,) the true and only efficient mode of teaching it is, to communicate those principles, in the shortest time, and by the most intelligible and impressive process, that may be found practicable.

And this process is *synthetical*. It is, clearly and correctly to announce the *principles*, in the form of theorems, and briefly state a few acknowledged and pertinent facts, by which they are supported, referring those receiving instruction, for further details, to such sources, whether in books or in nature, as may most abundantly contain them.

It is in this way that inquirers are most expeditiously, efficiently, and permanently informed; and, at the same time, instructed in the true mode of teaching themselves. It is in this way that they render their knowledge a subject of reason and judgment, not exclusively a matter of memory.

If, in many of our institutions, established for the purpose, a knowledge of several branches of science is acquired now, in a much shorter period than it was formerly, the fact is to be attributed chiefly to the improved method of teaching them, through the medium of *principle*. Were they not thus taught, the labour of

learning them *now*, would be nearly as great, and the process as tedious, as was that of studying and establishing them originally.

To no branch of science are these remarks more strictly applicable than to that of medicine. Taught through principle, the knowledge of it can be easily and pleasantly acquired, in a period of time that cannot, from its length, be discouraging to any one. *Three* years study of it *now*, is equal to *four* if not *five*, even as late as about the close of the last century. At an earlier period, the labour and difficulty, encountered in acquiring a knowledge of it, were still greater. And, in time to come, they will be yet further diminished, by a further and more perfect development of *general principles*; or, if the expression be less exceptionable, for its meaning is the same, by a further discovery, comparison, and generalization of facts.

Persuaded of the truth and importance of these views, in relation to the best scheme for hastening the march and facilitating the acquisition of scientific knowledge, and feeling it his duty to contribute, as far as possible, to the attainment of an end, which he deems so momentous to the welfare of man, it is the intention of the author of this dissertation, to present his readers with a succinct sketch of the *Analogy of disease*.

This is a mode of so generalizing in medicine, as to class complaints under the head of one great community, which he thinks may be rendered useful, both scientifically and practically, and which he is inclined to believe is altogether new. At least, he recollects no writer who has expressly treated of the subject. The attempt made by Dr. Rush to prove the entire unity of

disease, was altogether different. The truth of this will fully appear in the course of this disquisition.

In this enterprise, the author engages the more willingly, and with the livelier hope that his labours will not be altogether fruitless, from a thorough persuasion, that every new and successful effort to disclose the affinities which nature has established between morbid affections, and which render a knowledge of one of them essentially subsidiary to the understanding of the others, cannot fail to result in important practical good. On the subject of their pathology, general as well as particular, it exhibits broader, clearer, and more satisfactory views, throws additional light on their curative indications, and gives a more entire knowledge and command of the means to be used in their prevention and removal. In medicine, as in every other department of science, an increase of knowledge is an increase of power. But an increase of power is an increase of usefulness, provided the possessor be honest and faithful and industrious, in the employment of it.

As a further preliminary it is requisite to observe, that by *disease*, is to be necessarily understood, derangement of *parts*, as well as of *function*.

1. The first and most fundamental analogy, important to be noticed, as existing between diseases, is, that they all bear an exclusive relation to *living compound matter*. Neither of *spirit*, of *dead* matter, nor of matter in a *simple* condition, is disease predictable.

To be susceptible of disease, substance must be *excitable*. Neither a simple created substance, nor one destitute of excitability, can perform a *function*. But the spirit of man is simple, and *dead* matter is so de-

nominated, because it is *unexcitable*. Nothing, then, but compound excitable matter can become the subject of disease.

As already observed, disease implies a derangement of *component parts*. The truth of this is sustainable by analysis. But neither spirit nor simple matter consists of parts, and cannot, therefore, be subject to derangement. To speak of a disease *purely mental*, is to be guilty of folly.

2. A second analogy between diseases, consists in their being all the result of *irritation*, by which is meant, a kind of excitement unsuitable and injurious to the part sustaining it; and which is, therefore, produced by morbid impression.

When we contemplate the subject, as pathologists, acquainted with the present condition of our science, we cannot, on *first principles*, conceive of the production of a morbid affection in any other way; nor does *observation* present us with a single objection to the proposition stated.

For the better illustration of this subject, it is requisite to observe, that there are two kinds of impression, the *irritative* and the *sensative*, by both of which disease may be engendered. The *former* belongs to all living matter, while the *latter* would seem to be an exclusive attribute of *brain* and *nerve*. Extinguish the susceptibility of both, and every avenue for the admission of disease will be effectually closed.

But by such extinguishment, *life* itself would be destroyed; for irritability or a susceptibility of stimulation is an *essential* attribute of it. But wherever irritability exists, morbid impressions may produce *irrita-*

tion, which is here used but as another name for *morbid* excitement. Hence, constituted as living beings are, a liability to disease is a condition of their existence as radical and necessary, as those of specific temperature and specific form.

It is understood, that, by an *irritative* impression is meant, one that is productive of *no sensation*. The living being impressed, has, of course, at the time, no perception of the fact, and remains unapprized of it, until its effects have appeared. But, when powerful and long continued, the natural tendency of *irritative*, is to lead to *sensative* impression.

From irritative impression arise all endemic, epidemic, and contagious fevers. From this source, indeed, arise all diseases, of whatever description, that are engendered by the *insensible qualities*, usually denominated the *constitution*, of the atmosphere. Those qualities, called insensible, because they do not manifest themselves to our senses, produce, of necessity, all their effects, whether salutary or injurious, by *irritative* impression.

The poison of bilious fever, whatever type the affection may assume, intermitting, remitting, or continued, and whatever may be its degree of intensity, *excitive*, *inflammatory*, or *congestive*, invades the system through *irritability* alone, *sensibility* being, at first, in no degree, affected by the impression. Nor is any diseased sensation experienced, until after irritation has made considerable progress. When *congestion* has taken place, then does the impression become *sensative*. Then, and not before, is a *feeling of disease* awakened.

Similar remarks may be made in relation to typhus.

fever, pestis vera, scarlatina, influenza, measles, small pox, cow-pox, and lues venerea. At its commencement, the deleterious impression which produces them is exclusively *irritative*, and becomes *sensative* only when congestion has ensued. Individuals attacked by these diseases, experience no sensation to apprise them of the time of the invasion of the poison. The actual *sense of disease*, as already stated, follows as one of the effects of congestion.

The catalogue of complaints, produced by irritative impression, might be greatly increased, by the addition of tetanus, hydrophobia, scurvy, epilepsy, the class Neuroses generally, and a very extensive family of cutaneous affections. In all these, the impression becomes sensative, only as the effect of previous irritation.

The family of diseases produced by impression originally *sensative*, is also numerous. It consists of those that arise from vicissitudes in the sensible qualities of the atmosphere, from the passions of the mind, from intellectual operations generally, from mechanical injuries, from certain poisonous substances, from caustics, and from the action of caloric, when in such excess, as to terminate in burning. They are produced, in fact, by any impression that gives rise to sensation.

3. A third analogy between diseases, consists in a *derangement* of the *balance* or *equability* of *excitement*, or *circulation*, or both. This derangement belongs, as an essential attribute, to every morbid affection. Without it, imagination cannot even conceive of the existence of such an affection.

All enlightened physiologists agree, that perfect health consists in general equability of excitement and circu-

lation. Disease, therefore, being the reverse of this, must necessarily consist in a breach of that equability.

In maintaining that health is thus constituted, I do not mean that excitement and circulation exist in the *same degree* in all the various tissues of the body. Physiologists know that this is not the case. In bones, tendons, fasciæ, and fibrous membranes generally, those attributes of life do not prevail in as high a degree, as they do in brain, nerve, muscle, cellular membrane, and skin. My meaning, then, is, that they exist in the same degree in all the several parts of the same tissue; and that a deviation from this constitutes disease.

4. Another analogy between diseases is, that they all have their origin in the solid parts of the body; and that in cases where the fluids become deteriorated, the change is effected exclusively through the agency of disordered solids. The most slight and transient examination of the human body must convince us, not only that this is true, but that, in the existing state of things, *it cannot be otherwise*. Such is the relative situation of the *solids* and *fluids*, that no deleterious agent can reach the *latter*, and produce on them a morbid impression, without having passed through and injured the *former*. As well may it be alleged that a sword, a bullet, or a bayonet, can make its way through the skin, the muscles, the blood vessels, or the lymphatics of the body, with safety to the parts which it has thus penetrated, as marsh miasmata, the matter of small pox, the matter of measles, or any other poisonous substance. Nor can we conceive of any process, by which a deleterious quality can be *engendered* in the blood, or other fluids, except by the morbid action of the organs that

have formed, or the vessels that contain them. The fluids of the body being the product of the solids, must necessarily conform to their mode of action. Nor can that action be otherwise than healthy, while the solids are uninjured. Hence, all disease must necessarily originate in that portion of the body, which is alone primarily accessible to its causes.

5. A fifth analogy is, that all diseases are necessarily local in their commencement; and, such of them as become general, pass into that state through the medium of sympathy. Thus tetanus and inoculated small pox begin each in a small punctured wound, hydrophobia begins in a wound not dissimilar, inflicted by the tooth of a rabid animal, syphilis in a local irritation produced by a peculiar poison, and febrile diseases generally, from deleterious impressions made on the stomach, the skin, the lungs, or the brain; on the latter organ by moral and intellectual causes. Even scurvy and diabetes, the strongholds of humorism, can be proved incontestably to originate in local affections of the solids. That this is the case, with respect to every complaint, whether corporeal or intellectual, is a position as clear and as easily maintained, as any embraced in the science of medicine. The most deliberate and severe scrutiny will clearly and satisfactorily demonstrate, that, in its primitive action, every cause of disease is necessarily confined to a circumscribed portion of the human body.

6. But the most important analogy remains to be mentioned. It is, that the *internal pathology* or *immediate cause* of every disease, consists in *congestion*, in some given organ and tissue of the body.

This assertion, hazardous, perhaps, in the estimation

ef many, will, no doubt, by *some*, be pronounced to be unfounded. But, not to speak of absolute *demonstration*, it can be clearly shown to rest, at least, on the height of *probability*. In most cases it is susceptible of as positive proof, as any other opinion in the science of medicine. Its importance both in pathology and practice, gives it a fair claim to a brief analysis.

By the immediate or proximate cause of a disease, is to be understood, that particular condition of some part of the system, from which the complaint arises; which being present, the disease exists, and which being removed, the disease is eradicated. That, in *all* cases, this condition consists in *congestion*, satisfactorily appears from the following considerations.

By congestion is to be understood, a preternatural accumulation of blood in the vessels of any part of the body, either with or without inflammatory action. Although confined, for the most part, to the capillaries, it is not *always* or *necessarily* so; and is situated in the arteries or veins, or in both.

To render our analysis somewhat systematical, and therefore the more easily comprehended and remembered, we shall take a view of diseases as situated in the several subsystems of the body. For our present purpose it will be sufficient to consider those subsystems as divided into the *chylopoietic*, the *respiratory*, the *circulatory*, the *absorbent*, the *nervous*, the *cerebral*, and the *cutaneous*. What is true, on the score of congestion, as relates to diseases situated in these subdivisions of the body, can be shown to be true of all others.

Of the chylopoietic apparatus the diseases are various. Some of the most prominent of them, are, dys-

pepsia, diarrhea, cholera, dysentery, colic, jaundice, hepatitis, acute and chronic, and the affection produced occasionally by worms.

Of these complaints, congestion, in some of the abdominal viscera, at times throughout the whole extent of the portal circle, may be satisfactorily shown to be the proximate cause. In support of this assertion, the following considerations appear to be conclusive.

1. In each of the diseases specified, there exists *irritation*, i. e. morbid impression, as the feelings of the patient abundantly testify, in some one of the chylopoietic organs. But, as already stated, irritation in the capillary system never fails to produce congestion. If there be individuals who entertain doubts on this subject, let them irritate, in any way, the tunica albuginea, the skin, the lips, the tongue, the gums, the fauces, or any other visible part of the body; and they will find that congestion will presently ensue. Abrade a portion of cuticle, and the cutis vera thus exposed, white at first, will soon become red and distended with blood. Nor can pain remain long in any part of the body, without producing a similar effect.

2. The leading and characteristic symptoms of the complaints, we are considering, indicate clearly the existence of a centripetal state of action, which must necessarily produce *internal* congestion; while certain other phenomena or symptoms, to be mentioned presently, testify that this congestion is in the abdominal viscera.

The symptoms particularly indicative of a centripetal state of action are, a dryness or defective secretion and contractedness of the skin, with a bloodless con-

dition of that organ, a drying up of ulcers, and a disappearance of cutaneous eruptions, if any have existed, and a coldness and diminished size of the features of the face, the ears, and the upper and lower extremities. To speak in more general terms, the centripetal state of action is indicated by a reduction of bulk of the whole exterior of the body, particularly of those parts most remote from the center of circulation. To these symptoms must be added, a preternatural dryness of the lips, tongue and fauces, and of the schneiderian membrane generally, with a marked diminution of most of the other secretions of the body.

From the uneasiness and want of facility, not to call it actual stiffness, which the sick experience in voluntary motion, there can be little doubt of the diminished state of those secretions, by which the sheaths of the muscles and tendons, and the capsular and other ligaments of the joints are lubricated. Indeed general disease, and a general defect of secretion, appear to be naturally and necessarily associated. But secretion consists in *centrifugal* action. Hence a suppression of it indicates, of course, an opposite movement.

We derive much additional testimony, to the same effect, from certain internal and deep seated symptoms, which mark diseases of the chylopoietic viscera. These are, a sense of heat, tension, fulness, and weight, which the sick experience in the abdominal viscera, with an increase in the size of those organs, and a tenderness, at least, if not a soreness, to the touch. From nothing but a preternatural accumulation of blood can such symptoms arise.

Of the same import is the augmentation of secretion

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from the liver, pancreas, and internal surface of the alimentary canal, which takes place in diarrhea, cholera, and dysentery. No organ can, for any length of time, secrete superabundantly, without a superabundant influx of blood, from which the secreted fluid is derived. And of this superabundant influx, the immediate and necessary effect is *congestion*.

But on this topic, dissection affords us conclusive testimony. In relation to the diseases of which we are treating, that mode of examination has been practised, of late, on an extensive scale. And, in every instance, it has disclosed the presence of deep and extensive abdominal congestion. It has exhibited the whole portal circle engorged with blood. Nor does the evidence it has afforded terminate here. The coats of the stomach and bowels have been found inflamed, thickened, ulcerated, or in a state of sphacelation; the most indubitable and characteristic testimonials of congestion the parts can manifest.

Of this family of diseases, then, the question of the proximate cause is decided. Abdominal congestion produces them. Remove that congestion, and they cease to exist.

With the preceding affections, as already mentioned, may be classed that produced in the human system by epizootic worms.

Of this disease the proximate cause is gastric, intestinal, and general abdominal congestion, as manifestly appears, not only from its symptoms and requisite mode of treatment, but also from examinations of the bodies of those to whom it has proved fatal.

In the production of this complaint, the worms, being

themselves the offspring of antecedent diseased action in the alimentary canal, would seem to be only the exciting causes.

The abdominal congestion results *sympathetically* from the deleterious influence of atmospherical properties, sensible and insensible, on the surface of the body, or *directly* from improprieties in diet or regimen. From the congestion arises an augmented degree of irritability in the part. On this heightened irritability the worms produce an amount of morbid irritation, with all its deleterious concomitants and consequences, which, in a healthy condition of the alimentary canal, they could not effect—*which they would not produce, were there no congestion*. But by their irritation they augment the congestion.

Hence the *periodical* character of the worm disease, and its obvious connection with *certain states of the moon*.

That planet, at the times of her full and change, affects the atmosphere. The atmosphere, thus affected, produces, by its action on the surface of the bodies of the valetudinary, abdominal congestion, accompanied by augmented irritability. In this condition of things, the worms already existing in the alimentary canal, engender irritation and excite disease.

Of the respiratory apparatus, the only affections to which I shall invite the attention of the reader are, asthma, hooping-cough, hydrothorax, and peripneumonia notha. Of these, I am aware that, by nosological writers, the two latter are not classed with respiratory diseases. But, as far as respects the present disquisition, they are sufficiently of that description to be here con-

sidered. Indeed, to say the least, peripneumonia notha is as much a disease of the lungs as of the blood vessels.

Of these three complaints, the proximate cause is manifestly congestion. In proof of this, the evidence is the same with that adduced to establish the cause of chylopoietic affections.

The action of the system is centripetal, as chilliness, paleness of the skin, with a contracted state of that organ, shrinking of the extremities, and all other external phenomena positively announce; the feelings of the sick and the increased amount of secreted matter, bespeak in the lungs the presence of a superabundant quantity of blood; and of such superabundance dissection affords decisive testimony. The examination of the bodies of those who have died of the diseases we are now considering, has never failed to disclose a fatal degree of thoracic congestion—a degree, constituting the proximate cause not only of disease but of death.

The diseases of the *circulatory* are much more numerous than those of any of the other subordinate systems. By nosological writers they are arranged under the three heads of *Fever*, *Inflammation*, and *Hemorrhagy*.

But these are, in reality, nothing more than individuals of the same family, diversified in aspect by a few dissimilar features. Radically and substantially they are varieties of the same disease, their general likeness preponderating greatly over their slight dissimilarity.

Between *fevers* and *inflammations*, there exists no

difference that can be regarded as very *important*, much less *essential*. They both originate in *local* affections, and those affections are *always congestive*, and very often in both alike *inflammatory*. The chief difference that obtains between the topical affections, arises out of their situations. In fevers, those affections have their seat *always* in a mucous, and in inflammations, generally in a serous membrane. In the former, the internal coat of the stomach is principally, if not exclusively affected, in the latter, the peritoneum, the pleura, and the membranes of the brain most frequently suffer. Catarrh, croup, quinsy, and a few other exceptions to the latter part of this proposition, constitute no objection to the general rule.

The reason why the topical affection is noticed in inflammations and not in fevers, is the pain that accompanies it in the former, the sensibility of the serous membrane, when inflamed, being much more acute than that of the mucous. Yet, in bilious, typhus, and other fevers, particularly when violent, the tenderness of the gastric region to the touch is always perceptible, and sometimes exquisite. Change reciprocally the seats of the topical affections, in bilious fever and peripneumony, transferring the affection in the former disease to the serous membrane of the thorax, and, in the latter, to the mucous lining of the stomach, and the two complaints will be converted into each other. Peripneumony will become bilious fever, and bilious fever, peripneumony. The same thing may be said of typhus fever and phrenitis, or even of pestis vera and rheumatism. Make, as to place and tissue, a mutual transfer of the topical af-

sections; which constitute the radices of those complaints, and you convert the complaints into each other.

Between *inflammations* and *hemorrhages*, the strongest possible affinity exists. They occur in similar subjects, under similar circumstances, with similar phenomena, and at the same seasons of the year. The only appreciable difference between them, consists in the actual flowing of the blood. Rupture, or otherwise open the blood vessels of the part inflamed, and the complaint becomes hemorrhagy; close too suddenly, in hemorrhagy, the bleeding vessels, and the disease becomes inflammation. Every febrile hemorrhagy would be inflammation, did not the overloaded vessels give way; and were the vessels of a congestive part always to give way, inflammation could never ensue.

But the strong analogy existing between *inflammation* and *fever*, has been already demonstrated; therefore, *fever* and *hemorrhagy* must be also very strongly analogous to each other. Hence the analogy between the three forms of disease must be equally striking.

But to consider the subject more in detail.

Of that division of disease denominated *fever*, abdominal congestion, sometimes *inflammatory*, and sometimes not, constitutes incontestably the proximate cause. This is as true of typhus, as it is of common bilious fever; as true of pestis vera, as it is of yellow fever; and as true of small pox, scarlatina, and other exanthemata, as it is of either.

The correctness of this representation, appears as well from the external pathology or symptoms of the complaints, as from the more conclusive evidence furnished by dissection.

In all febrile affections, the action is, at first, very strongly *centripetal*. Hence the balance of circulation is broken, the vessels of internal parts receiving a preternatural quantity of blood, which necessarily throws them into a state of congestion. And that this congestion is in some of the viscera of the abdomen, the irritation, soreness to the touch, general uneasiness, anxiety, and distress, with the sense of fulness, weight, and burning, experienced in some part of that cavity, indubitably testify. The nausea and vomiting that so frequently occur, indicate specifically, congestion of the stomach.

But, did these symptoms permit any doubt to remain, as to the proximate cause of fever, the testimony of dissection entirely removes it. On examining the bodies of those that have died of febrile complaints, evidence of abdominal congestion is always discovered. Without internal congestion of some kind, neither can death take place, nor disease prove dangerous. External congestion annoys and distresses, but does not kill.

That local congestion exists as the proximate cause of *inflammation*, is a point so clear, and so universally admitted, that to dwell on it, with a view to illustration or proof, would be superfluous. The very name bestowed on the disease is a recognition of the fact. Phlegmasia means an *inflammatory* complaint; and to inflammation, congestion is essential. It is one of its indispensable elements, without which it cannot exist.

Is the local inflammatory affection situated externally, on the tunica adnata, or any portion of the skin?

The augmented redness and size of the part, render the congestion perfectly visible. And if it be internal, the nature of the affection is equally indicated by the symptoms that exist. But here, as in other cases, the proof derived from dissection *is positive.*

To hemorrhagy, similar remarks may be applied. Does the flux of blood take place from an internal part? The precursory symptoms of a sense of heaviness, heat, tension, and fulness, indicate conclusively the presence of congestion. Is the hemorrhagy more external, as in epistaxis? An itchiness of the part, an augmented redness of the schneiderian membrane within the nares, and a similar redness and wateriness of the eye, give satisfactory evidence to the same effect.

Add to these considerations, that without a preternatural accumulation of blood in a part, where all the vessels are capillaries, a copious hemorrhagy from it would be impossible.

It appears, then, from evidence not to be controverted, that the diseases, of the *circulatory* system are strongly *analogous*, not only to each other, but also to those of the *chylopoietic* and the respiratory.

Of the absorbent system, scrophula is the only disease to which I shall direct the attention of the reader. On the subject of this, my remarks will be but few, as our knowledge of it is but limited. It consists chiefly in a torpid condition of the absorbing vessels, manifested by a preternatural enlargement of the lymphatic glands, running on to inflammation and suppuration, as far as the parts are capable of the latter process. But, referring the reader to what has been already said, on the subject of inflammation, it is scarcely requisite to add,

that torpor of action begets *congestion*, and that of every preternatural enlargement *congestion* is the essence. This view of the subject is confirmed by dissection. I shall only further observe, that the most hopeless form of consumption, which all acknowledge to be a congestive disease, is nothing but scrophula thrown on the lungs.

As diseases of the cerebral system, may be mentioned, apoplexy, palsy, delirium, epilepsy and madness.

Of the three first of these, the proximate cause will not be doubted. That it consists in congestion of the blood vessels of the brain, is not only rendered obvious by symptoms, and admitted by all enlightened pathologists, but demonstrated by dissection.

Nor, as relates to epilepsy, is the testimony we possess less satisfactory. The paroxysms of that complaint are marked by an unusual fulness and protrusion of the eye, a frothing at the mouth, and a stupor as deep as that of apoplexy. The disease, moreover, often terminates in hydrocephalus internus, idiocy, and insanity. But while these affections clearly point to the existence of congestion, as their proximate cause, dissection again confirms it.

Madness is *chronic and confirmed delirium*. It stands related to acute or real delirium somewhat as palsy does to apoplexy, or chronic to acute rheumatism. It is usually marked by obstinate wakefulness, often by a red, protuberant, and watery eye, and, like epilepsy, terminates, at times, in hydrocephalus internus. The action of the carotid arteries is preternaturally strong, and the senses of vision and hearing, and sometimes also that of smell, are inordinately acute.

But it need scarcely be observed, that these phenomena afford strong ground to infer the existence of cerebral congestion, an inference which dissection, as far it has thrown any light on the subject, tends to confirm.

In relation, then, to cerebral disease in general, there is reason to believe that its proximate cause is cerebral congestion.

As belonging in any measure distinctly and exclusively to the nervous system, I shall specify but three diseases, tetanus, St. Vitus's dance, and hysteria. Although hydrophobia is essentially a febrile disease, it exhibits, notwithstanding, such a deep and peculiar affection both of the nerves and brain, as to deserve to be noticed under the present head.

Of tetanus, St. Vitus's dance, and hysteria, the two first have their seat more exclusively in the nervous system, while the latter would seem to be of a more mixt character, gastric, but more frequently, perhaps, uterine congestion, as the name of the disease imports, constituting a part of it.

In relation to the proximate cause of these diseases, it is a matter of regret, that dissection has not yet furnished us with lights so abundant and satisfactory, as those we have derived from it with respect to most other complaints. As far, however, as it has gone, the evidence it has afforded us is clearly indicative of nervous congestion. From that evidence it appears, that, particularly in tetanus and hydrophobia, (a) the vasa nervorum, or minute vessels which carry blood to the nerves and spinal marrow, are preternaturally distended with that fluid. In a few cases they have been found to be as perceptibly, although not so extensively, injected

with blood, as are the vessels of the tunica adnata, in inflammations of that membrane. One of the most painful and violent cases of convulsion I ever witnessed, proceeded from congestion, certainly in the *spinal marrow*, and *perhaps* in some of the nerves immediately connected with it. (b)

But other circumstances afford strong collateral testimony.

In the diseases we are considering, the susceptibility of the nerves to the impressions of certain stimulating agents is preternaturally *augmented*, which clearly indicates in them a *superabundant amount* of vital power. But as far as reason and analogy may be confided in, such superabundance can arise only from congestion, or a superabundance of fluid in the vessels that supply them with blood.

Arterial blood, having itself, acquired, in the process of respiration, the vital principle, conveys and imparts it to the solids of the body. But, to bestow a superabundance of it on any organ or part, it must itself superabound there. In other words, in the vessels of that organ there must be a congestion of arterial blood.

Such is the inference reason would draw, and facts are not wanting abundantly to confirm it.

When it is required of any organ to make, in the performance of its function, a preternatural expenditure of vitality, as is the case in secretion, digestion, the healing of wounds, and the imparting of nourishment and life to the foetus in utero, that organ is always supplied with a superabundant quantity of arterial blood. In other words, the organ is, for the time, in a state of *actual congestion*.

Unless the parts immediately around an incised wound become distended, preternaturally red, and increased in temperature and sensibility, union by the first intention never takes place.

During the period of gestation, the congestion of the uterus is known to be great. Remove it by hemorrhagy, or in any other way, and the death of the fœtus must necessarily ensue.

While performing the important function of digestion, the stomach is a center of fluxion, and receives of arterial blood much more than its customary supply. Were it not for this, it would be so far exhausted of its vitality and strength, as to be rendered unfit for the execution of its office.

When the brain is labouring intensely in the work of intellection, it requires and receives a superabundance of blood. Place the body in a position inclining to the horizontal, and this superabundance is most readily supplied. Hence many individuals use their intellect to the greatest advantage, in a recumbent posture. (c)

The same thing is true of every organ of the body, when engaged in any *unusual exertion*. To render it equal to its task, it is supplied with an unusual quantity of blood. And, as far as the laws of the system are understood, it does appear, that in no other way can an augmentation of vital power be effected. Another striking example to the same effect we have in the *sanguineous* congestion of the penis masculinus, which *alone* prepares it for the performance of its function. Prevent this congestion, and the propagation of the species will immediately cease.

From these premises, which might be strengthened

by many additional facts, the inference seems not only fair but irresistible, that in tetanus, St. Vitus's dance, and other diseases of the same family, the inordinate augmentation of vitality in the nerves, arises from a *congestion* of arterial blood in the *vessels* that supply them with that fluid. I mean, of course, the *capillary* vessels, or what may be denominated the *vasa nervorum*.

However numerous and important the diseases of the *cutaneous system* may be, sanguineous congestion is their proximate cause. They are divided into *pyreptic* and *apyrectic*, or general and local.

In all exanthematous fevers, such as small pox, measles, kine pox, chicken pox, scarlatina, erysipelas, and urticaria, the eruption is to be regarded as a cutaneous affection. But it is scarcely necessary to add, that to the existence of this affection, congestion is essential. The evidence of the fact is ocular and demonstrative. All eruptive fevers exhibit so many instances of *centrifugal*, and therefore *salutary metastasis*, in which *gastric* is converted into *cutaneous*, or at least *internal* into *external, congestion*.

As relates to my present object, it would be superfluous to dwell on the local diseases of the system I am considering. It is sufficient for me briefly to observe, that we cannot even conceive of cutaneous eruption, as an *effect*, without connecting it with congestion as its *cause*. The latter bears to the former the same relation that the root of the plant does to the stalk and branches, which it sends forth and nourishes. The idea of a rootless oak would not be more incongruous, than that of an eruptive affection without congestion.

Were it requisite to proceed in this investigation, it would be easy to show, that of dropsy, diabetes and scurvy, congestion is as obviously the proximate cause, as it is of either of the other diseases of which I have spoken. The two first of these complaints consist in excessive secretion. But it has been already remarked, and is now repeated, that without congestion such excess can never occur. And in real scorbutic affections, dissection has shown, that gastric and general abdominal congestion always exists.

From the foregoing facts and observations, which might be multiplied and extended to an indefinite length, it may be inferred, I think, as an axiom in medicine, that, *congestion is essential to the existence of disease*. It is itself, indeed, the necessary result of preceding *irritation*. But without it, the constitution could not, by irritation alone, materially suffer.

But if diseases are so strikingly analogous to each other in their pathology, consisting in congestion in some part of the body, reason would seem to warrant the conclusion, that they are analogous also in their indications of cure. And such, on examination, appears to be the fact.

The *general* indication, including all *subordinate* ones, as parts of itself, and applying indiscriminately to every complaint, is to remove congestion, by equalizing circulation and excitement. That being effected, the disease resulting from it will necessarily cease.

In all cases where it is practicable, the first thing to be done, in the removal of congestion, is to extinguish the irritation by which it has been produced. Has it been excited by the introduction into the flesh of a me-

chanical substance, such as a briar, a thorn, or a nail? Extract immediately the offending body. Has it been brought on by *mechanical pressure*? Remove it. Should the irritating cause be permitted to operate, the congestion, even if resolved, will necessarily return.

As essential, then, to successful practice, it is the duty of the physician to free his patient, as speedily as possible, from the influence of the remote and exciting causes of his disease. What these causes are, and how they are to be removed, are points respecting which no specific directions can be given, without entering into a minuteness of detail, which the nature of this dissertation forbids. To the judgment and skill of the attending physician must the adjustment of that matter be necessarily referred.

The fundamental irritation being properly disposed of, the subordinate indications for the removal of congestion are four, *compression*, *depletion*, *revulsion*, and *stimulation*. By the well-timed and skilful application of these, does the educated physician distinguish himself from the empirick.

Compression. This is to be effected in part by friction, but chiefly by the judicious and dextrous use of the bandage. It is applicable only, or at least principally, to cases of external congestion, such as whitlows, enlargement of particular glands, anasarcous affections, swellings of joints and muscles that can be compressed, and certain other projecting tumours. It is also applicable, to a limited but very useful extent, in cases of congestion of the abdominal viscera. In the treatment of diarrhea, cholera infantum, and protracted dysentery,

the bandage around the abdomen, has been often applied with the happiest effect.

This remedy operates in a twofold way. It promotes absorption, and sustains and aids debilitated vessels in their circulatory action. Make the bandage of flannel, or of a soft cotton fabric, and it contributes also somewhat to the promotion of perspiration. On each principle its action is salutary. To prove effectual, it must be kept in constant operation, until the morbid affection disappears.

Friction may be performed with the hand, with a flannel cushion well stuffed, with a flesh brush, or any other article calculated for the production of moderate excitement and agreeable sensation. Its action is aided by the use of certain stimulating substances, both dry and liquid. It may be usefully employed in many cases of disease, deep-seated as well as superficial; but more especially in those that are chronic and indolent. To derive from it all the benefit which it is capable of affording, it should be frequently repeated, long continued at each repetition, and perseveringly pursued.

Depletion. When examined and understood, in all its bearings, this remedy also is perceived to operate in a variety of ways. It promotes absorption, reduces the force of morbid action, so as to bring it within the control of the curative powers of nature, and abstracts the blood from the overloaded vessels. The modes of effecting it are two, *bloodletting* and *secretion*. To the latter belong both puking and purging.

Bloodletting is either local or general. It is local when the blood is drawn immediately from the vessels of the part affected. In cases where general fe-

ever as well as topical congestion exists, this mode of depletion avails but little. In many instances it proves injurious. When local congestion exists alone, without producing general excitement, topical evacuation may be advantageously practised. Remove congestion when thus existing, and provided the irritation be also removed, it does not necessarily return. But if, at the same time, fever prevail, its return is almost certain.

Local bloodletting is performed by leeching or cupping, applied immediately to the place of congestion. It is employed chiefly in superficial affections, those that are deep-seated being beyond its reach.

To produce on congestion, which is necessarily *local*, the effect of depletion, *general* bleeding must be carried to such an extent, as greatly to weaken the action of the heart. Should it induce fainting, unless in cases where peculiar circumstances forbid such an effect, it will be the more beneficial. If it be not pushed so far as to reduce very materially the force of the circulation, it is worse than useless. It wastes the vital fluid, and detracts from the energy of the powers of nature, without in any degree weakening the disease. Let this evacuation, then, be regulated, not by the quantity of blood drawn, but by the effect produced.

Under the influence of general bloodletting, the capillary vessels of the congested part can be emptied only by their own action. That they may succeed in their efforts to empty themselves, all obstructions to their success must be, as much as possible, removed. But the chief obstruction is the action of the heart, which preserves a plenitude of blood not only *in them*, but in all the large vessels leading to them and from them. Re-

move that plenitude, and they will empty themselves of their superabundant fluid.

It is a well known property of the capillaries, that they continue to act long after the heart, lungs, and other large organs have ceased. They even act after other parts are dead. When the heart itself is no longer capable of dilatation or contraction, its capillaries act.

In general bloodletting; then, let the blood flow until syncope has occurred, or at least until the heart has become greatly enfeebled in its action. Under these circumstances, the congested capillaries, finding no longer any hindrance from the fulness of blood in the adjoining larger vessels, empty themselves, by contraction, of their superabundant fluid. Thus freed from preternatural distension, they have time, before the heart recovers its full force of action, to acquire such a degree of tone and vigour, as may enable them to protect themselves from another congestion.

To illustrate this doctrine by a familiar example.

Bleed an ophthalmic patient until he faints. The capillaries of the inflamed and reddened tunica adnata will immediately so far empty themselves, as to restore that organ to its natural colour.

Let the topical congestion be visible in any other part of the body, the effect will be the same. Let syncope be brought on, and the external capillaries generally will empty themselves, by contraction, of their blood, and induce that paleness which overspreads, in fainting, not only the lips, cheeks, and forehead, but the entire surface of the body.

The loss of blood, like the amputation of a limb, or the forcible and unnatural removal of any other ele-

nentary part of the body, is, in the abstract, an evil, and should never be recommended or submitted to, except as a preventative of something worse. To produce, therefore, the desired effect, with as slight an expenditure of blood as possible, it is found expedient, where it is not forbidden by peculiar circumstances, to perform venesection with the patient in a sitting or standing posture. With the body thus placed, the abstraction of a pound of blood, produces a stronger effect, than the drawing of twice that amount, when the position is recumbent.

Under this head I shall only further remark, that bloodletting is not a curative remedy. It is only palliative and preparatory, weakening morbid action, mitigating pain and suffering, awakening susceptibility, placing disease under the control of nature, and facilitating the operation of other remedies.

In this place, as not being altogether foreign from the present division of our subject, may be mentioned another remedy which is often efficacious in the removal of congestion. It is the application of cold water to the part affected.

This would seem to operate in a threefold manner. It evacuates or abstracts the matter of heat, when it superabounds, promotes absorption by its action on the lymphatics, and stimulates the overloaded and distended vessels to contract, and relieve themselves from their superabundant blood. It is important, however, to observe, that unless directed with judgment and skill, the application of this remedy is likely to do mischief. When the congestion is intense, it should never be employed. In the *incipient* and *declining* stages of the

affection, it is safe and efficacious; but hazardous and inadmissible when the complaint is at its height. There are few modes of practice by which quackery does more mischief, than by the *indiscriminate* application of cold water to inflamed eyes.

The employment of warm water in cases of congestion is often a safer and more efficacious mode of practice. This remedy produces its effects also by stimulating the overloaded vessels, augmenting their action, and thus enabling them to free themselves from their superabundant contents. It also excites secretion and absorption, both of them auxiliary processes in the removal of congestion.

Secretion, as a mode of evacuation, contributes to the removal of congestion in a twofold way. It depletes *generally*, or acts *locally* and *immediately* on the congested vessels, abstracting gradually a part of their contents.

In the former mode, every secretion necessarily acts according to its extent, the amount of the secreted fluid being so much abstracted from the volume of the blood. But the secretions that deplete most copiously and powerfully, are the cutaneous, the urinary, and the alimentary, the latter including those by the liver and pancreas.

Considered in the abstract, these may act indirectly in the removal of any topical congestion, by at once reducing the force of the circulation, and diminishing the amount of the circulating fluid. They act also, to a certain extent, as *revulsives*, in relation both to circulation and excitement. An augmented degree of circulation and excitement in the skin, operates *necessarily*, because in conformity to a principle of nature, by way of

revulsion from internal parts. The surplus of excitement and circulation accumulated in the skin, is so much drawn from other organs.

When congestion is seated in the liver, the secretion of bile diminishes it *directly*, by abstracting *immediately* from the contents of the overloaded vessels. Hence, in gastric and hepatic affections, preparations of mercury and antimony afford relief, not merely, nor even *chiefly*, by evacuating the contents of the stomach and bowels, but by promoting secretion when defective, and correcting it when morbid.

If the congestion be in the lungs, the secretion from the mucus membrane that lines them, operates in the same way towards its removal. And if it be in the sauces, the same effect is produced on it by the secretion of mucus from the investing membrane. If it be deep-seated in the midst of muscle and cellular substance, and cannot be otherwise made to disappear, nature institutes, for its removal, the secretion of pus. Of all these processes, the object and effect are precisely the same; *to carry off congestion*. And, in most instances, the end is attained by an augmented secretion from the part in which the congestion is situated.

Revulsion. It has been already adverted to, as a principle in the economy of animated nature, that *action* and *circulation* are not only associated, but are in proportion to each other. If to this principle a few exceptions exist, they are to be received as exceptions, and nothing more. Moderate excitement in a part is accompanied by moderate circulation, excessive excitement, by superabundant circulation, and an extinction of excitement, by an extinction of circulation.

Another principle is, that the human constitution is capable of sustaining, at the same time, a given amount of excitement, and no more. If, therefore, it be excessive in one part, it will be defective in another; and if it be produced in a high degree in any part, where it has not before been *preternatural*, it will be diminished in another where it has been so. *Preternatural* excitement, then, in one part, draws such excitement from another. This is what we mean by the term *revulsion*. To illustrate it by example.

The excitement of the brain, by fear or anger, removes the excitement and pain of tooth-ache; the excitement of the stomach by an emetic, by laudanum, by water as hot as it can be swallowed, or by coffee, removes the pain and excitement of sick head-ache; the excitement of the skin, by a sinapism or an epispassic, relieves or cures preternatural excitement and pain in the pleura or the peritoneum; and external excitement produced by warmth, caustic, or actual burning, mitigates or removes the internal pain and congestion of rheumatism. The excitement of the brain, by a sentiment of ambition and a love of battle, has often removed the abdominal excitement productive of intermitting fever, scurvy, and other diseases of the chylopoietic viscera. Thus, seamen rendered unfit for duty, and even confined to bed, by those complaints, have, on coming in sight of an enemy, left their hammocks, stood at their quarters, and worked their guns during action, and recovered rapidly after the victory achieved by their valour. This interesting spectacle was exhibited by many seamen, and several officers, of the American squadron, that, under the command of Commodore

Perry, triumphed so gloriously, on the waters of Lake Erie, over a foe superior both in numbers and equipment. Even to excite the feet by the heat of a fire, cures, not unfrequently, the excitement of colic. It is to be remembered, that in all these cases, the *remediate excitement produced*, as well as that which it removes, is accompanied by congestion. It appears, then, from the foregoing facts, that, on the principle of *revulsion*, congestion *within* is relieved or cured by congestion *without*. Preternatural excitement and congestion in the head, are also relieved or cured, by the same affections in the feet. To all practitioners these things are familiar.

On this topic I shall only further observe, that, to act *revulsively*, remedies must rarely be employed during the existence of fever. In the treatment of the *febres* and *phlegmasiae* of Cullen, the removal, or at least a very marked reduction, of febrile excitement should always precede the application of blisters. Nor, *during the prevalence of fever*, can any other kind of local external excitement prove efficacious, in the removal of congestion and pain. On the contrary, it usually aggravates them.

Stimulation. It is only in cases of great languor, torpor, and debility, when the system, exhausted by the violence or continuance of disease, has sunk into a state of *collapse*, or when it is *overwhelmed* and *paralysed* by the *force* of the *original morbid impression*, that this remedy should be employed, for the removal of congestion. I mean particularly for the removal of congestion in *febrile* affections. When no such affection exists, stimulants of some kind may be always employed.

Cases of *exhaustion* and collapse we have in the *advanced stages* of severe attacks of *bilious, typhus*, and others fevers. Cases of *oppression* we find in the *commencement* of the malignant or congestive form of the *same complaints*.

In the treatment of inflammatory congestion, accompanied by a general affection, stimulation is not admissible. It should be employed only to arouse into action the vessels of the congested part, when they are too feeble and torpid to maintain the circulation of the blood. It is with this view that brandy, wine, opium, and other powerful stimulants, are administered in the oppressed and exhausted states of fever.

Another analogy between diseases is, that, as they are all *produced*, so are they *cured*, by irritative and sensative impressions on the solids, not by any medication of the fluids. Although it is, perhaps, *possible*, that, in a debilitated and disordered condition of the digestive and assimilative powers of the system, certain medicinal substances *may*, unchanged in their qualities, gain admission into the blood, the event is a very rare exception to the general rule, and can never prove tributary to the restoration of health. On the contrary, the effect of foreign substances, thus admitted into the circulation, must be necessarily injurious. If introduced during health, they deteriorate the blood, and cannot, therefore, restore its healthful qualities, by being mingled with it in an unsound condition. The only effect of such admixture must necessarily be, to render its condition more unsound. A foreign and dead substance floating in the blood, is like a foreign substance thrust into the flesh. It must irritate and do mischief.

Dead and living matter cannot remain harmoniously and healthfully in contact.

In many diseases the blood is doubtless deteriorated in its qualities. But the morbid change in it is produced not by the *immediate* influence of the causes of disease, but by the deranged action of the solids. Nor can its soundness be restored in any other way, than by removing such derangement, and restoring to the solids their healthful functions. The deleterious condition of the blood is but a symptom of disease, and, like other symptoms, disappears when the disease is eradicated—when its proximate cause, *congestion*, is removed.

To prescribe remedies with a view to their *immediate* action on the blood, is like an effort, in fever, to remove the hot skin, the parched tongue, or the aching head, without removing the disease itself. It resembles the fatal error of the mariner, unskilled in his profession, who, to change the course of his ship, and prevent her from dashing on a reef or a sand-bar, shifts a sail, instead of altering the direction of the rudder; or the practice of an ignorant agriculturist, who, with a view to the destruction of a deleterious shrub or weed, contents himself with plucking a leaf, or lopping a branch, instead of cutting up the plant by the roots.

The last analogy between diseases which I shall mention, I deem important on the score of practice. It is, that after the most skilful and successful employment of the most appropriate and active remedies, we must rely, ultimately, on the recuperative powers of nature, for the *complete* solution of existing congestion. Of every complaint, whether severe or otherwise, this is

true. The physician never *cures* a disease, but, acting merely an *ancillary* part, *aids nature* in the important process. His true course of practice is, so far to weaken disease, as to bring it under the control of nature, and then interfere with remedies no further, except to regulate and palliate symptoms. For that purpose he must hold himself on the alert until convalescence is complete.

But it is more especially in chronic diseases that the physician must trust to the powers of nature, and become himself her observer and auxiliary.

In these complaints it is rare that the remedial substances have an immediate and specific effect on the coagulation or proximate cause of the disease. In some instances they certainly have. But, in general, their efficacy depends chiefly on their salutary operation on the system at large. In this way they invigorate the powers of nature, and these powers remove the complaint.

Between the treatment of acute and chronic diseases, the difference in this respect is striking. In the former, the strength of the complaint is to be so reduced, as to be rendered inferior to the powers of nature. In the latter, the powers of nature are to be raised to a superiority over the complaint.

Hence, in chronic practice, the importance of every thing that can invigorate the system, including diet, clothing, exercise, air, sleeping and waking, and the general regulation of the intellect, more especially the regulation of the passions.

Between the diet requisite in the treatment of acute and chronic diseases, I apprehend that the difference is

not always made an object of sufficient attention, even by practitioners of high respectability. In the former case, the diet can scarcely be too bland, light, and moderate in quantity. In the latter, it should also be bland; but it must be nourishing and restorative, and given in such quantity as to strengthen the system. In acute disease, animal food of every description is inadmissible. In chronic disease, where no fever prevails, certain kinds and forms of animal food are not only admissible, but often necessary. The object to be attained, in the two schemes of practice, being held in mind, the means can never be mistaken. In acute diseases, *action is to be reduced*, in chronic, *power is to be invigorated*. But to effectuate these two objects, kinds and forms of diet not only *different* but *opposite* are essential. It must not, however, be forgotten, that in the use of diet, as well as of the other non-naturals, the habits and mode of life of the patient should be carefully consulted.

If, then, according to the views contained in the foregoing disquisition, diseases exhibit analogies so numerous and striking, in what, it may be asked, do they differ from each other? Or does it follow that they do *not* differ at all, but that the doctrine of the *unity* of disease is true.

I answer, the doctrine referred to is not true. Diseases do differ from each other, and the chief sources of their difference appear to be as follows. 1. A difference of remote cause. 2. A difference in the *particular tissue* or structure in which the disease is situated. 3. A difference in the *general organization*, the functions, (*d*) and sympathies, of the part diseased. It need scarcely

be observed, that these three causes, under all the changes and combinations, of which they are susceptible, are competent to the production of an immense variety of disease.

Different poisons or deleterious substances, as those of small pox, measles, influenza, and scarlatina, acting on the same tissue, suppose it to be the mucous membrane of the alimentary canal, must produce necessarily different morbid impressions, awaken different kinds and degrees of sympathy, and give rise to different general results. This proposition, resting on the converse of the axiom, that similar causes, acting under similar circumstances, produce, of necessity, similar effects, may be thus constructed into another axiom, *that dissimilar causes, acting under similar circumstances produce dissimilar effects.* I might even add, that, for the most part, if not always, dissimilar causes acting under *dissimilar* circumstances, produce *dissimilar* effects.

The same deleterious cause, throwing its action on parts differing in structure, susceptibility, and power, must necessarily give rise to different affections. Thus, although produced in each case by mechanical violence, atmospherical influence, or any other identity of cause, congestion and inflammation are exceedingly different, both in appearance and result, according as they are situated in the serous, mucous, cellular, or fibrous membranes. And still further differences arise, when they have their seat in the cutaneous, the osseous, or the lymphatic system, the discrepancy of result corresponding, in every case, with the discrepancy of structure, susceptibility, sympathy, and power of the part affected.

When organs differently constructed, performing dif-

ferent functions, possessing and exercising different sympathies, and therefore of different uses in the economy of the system, receive an injury from the same cause, the issue again is necessarily different.

Let the organ injured be the brain, the lungs, the stomach, or the uterus, and the lesion be produced by mechanical violence. It need scarcely be observed, that, in each case, the morbid affection will be different. In one instance, coma, delirium, or madness will appear; in another, deranged respiration, with its deleterious effects on the blood, and the system at large; in the third, derangement of the digestive system, with its dismal assemblage of concomitants and consequences, and, in the fourth, intense pain, and suspended or disordered menstruation, with all the distressing sympathetic affections that derive their existence from uterine disease.

Is the morbific impression made on the eye, the ear, the nares, or any of the organs of generation in the male? Again must the disease, arising from this impression, be different, according to the part in which it has its seat. In fine, wherever there exist, in the human body, difference of structure, susceptibility, function, and sympathy, there must necessarily be exhibited different diseases, whether they be produced by the same or by different remote causes.

The differences of disease produced by the causes just recited, may be considered specific, radical, and immutable. Being the offspring of nature, in her ordinary course of operation, nothing but a change in that course can abolish them. To expect their extinguishment, on any other ground, would be to look for verdure and fragrance in the depth of winter, or ice and snow amid the fervours of June.

Other causes, consisting in difference of age, sex, temperament, idiosyncrasy, occupation, mode of life, and place of residence, if they do not give rise to *different* diseases, produce, at least, great variety in the same disease. These, although too generally regarded as matters of minor importance, deserve, notwithstanding, the most serious consideration of the practitioner of medicine.

Another very fertile source of variety in disease, is the peculiar condition of the constitution at the time of attack. If it be *sound*, the complaint will present *one* character; if *shattered*, a very *different* one.

A *scorbutic* dysentery differs materially from one in which no such diathesis prevails. The same disease will be in many respects exceedingly different in *dyspeptic* subjects, and those that are *not dyspeptic*—different where the liver is the seat of some chronic affection, and where it is not.

The varieties in phthisis pulmonalis are numerous and striking. That variety known to be *most* striking, as well as most irremediable, arises out of a *scrophulous* diathesis. To many other complaints, similar remarks are equally applicable.

All these differences in the same disease, are attributable to the different susceptibilities, powers and sympathies of certain organs, accordingly as they are in a sound or morbid condition.

How far the peculiarities of the several permanent varieties of the human race may lay a foundation for different diseases, it is not my present purpose to hazard an opinion. The subject, curious in the science, and not unimportant in the practice, of medicine, deserves from pathologists more attention than it has heretofore received.

END OF MEMOIR III.

NOTES TO MEMOIR III.

Note (a) page 202.

In some dissections, in cases of hydrophobia, the only congestion discovered, is represented to have been in the pharynx, esophagus, and stomach.

In these instances, the nervous affection had been either sympathetic, or the congestion of the spinal marrow, and of the nerves connected with it, had been removed by the contraction of the engorged capillaries (the *vasa nervorum*) after the heart had ceased to act. For it is known that the capillaries *do* contract, for a considerable time after the lungs have ceased to play, the nerves and brain to feel, or the heart to move.

In most dissections, in hydrophobic cases, the spinal marrow and nerves have been found congested. A preternatural dryness of the muscles, or rather of their sheaths, is also reported to have been usually discovered. This indicates a deficiency in the secretory process, destined to moisten those parts. The blood pressed out of *their* vessels, by morbid contraction, is probably thrown on the nerves and spinal marrow.

Note (b) page 203.

This case of disease was altogether anomalous, and arose from an injury accidentally done to the spinal marrow, when the subject of it was running. *Post mortem* examination established the fact. Congestion in the nerves was scarcely so apparent, as to justify a positive assertion that it existed.

Note (c) page 204.

This was remarkably the case with the late Mr. Pitt. It is understood that that great statesman planned and matured, *in bed*, his most brilliant and effective schemes of finance and war. Nor was it the mere quietude and abstraction of his chamber that aided his intellect. All other things being alike, his mental exertions were not

only attended with less labor, but were more satisfactory to him, when he was lying in bed, or reclining on a sofa, than when seated at his desk. Hence, instead of writing himself, he often lay and dictated to an amanuensis. And hence the process of "*consulting our pillow,*" in matters of *intellect*, as well as of *morals*, is more important than it is generally considered.

Note (d) page 219.

Every organ has a twofold connection with the system; by *function*, and by *sympathy*. Hence the existence, therefore, on this ground, of a twofold source of difference in disease.

Suspend or derange the process of digestion, and from that suspension or derangement alone will the system suffer. But it will also suffer, in various parts, the heart, the lungs, the brain, and the nerves, from the extensive range of powerful sympathies, which the stomach possesses. Hence, in dyspepsia, the sympathetic affections are more troublesome and distressing, than those arising proximately from digestive derangement.

Derange severely the condition of the liver, and not only is the system injured by the *want*, or the *vitiated character*, of the bile, but madness, hypochondriasis, or severe rheumatic affections, are produced by the sympathies of that organ with the other parts of the body.

The same is true of the brain, the kidneys, the skin, the muscles, and all other important organs. Derange them, and mischief is done, as well by the disorder of their functions, as by that of their sympathies.

Notwithstanding the importance of **FUNCTIONAL** connection between single organs and the general system, the great majority of diseases is *produced* and *cured*, through *the medium of sympathy*. In no case can disease of function be separated entirely from sympathetic disease. Their connection is as indissoluble as that of substance and shadow.

THE END.

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